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The Executive Compensation Controversy: A Transatlantic Analysis

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The Executive Compensation Controversy: A Transatlantic Analysis*

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1. Introduction

Compensation in the United States of America (USA) financial services industry became highly controversial in early 2009 amid revelations that Merrill Lynch paid substantial year-end bonuses to its executives and employees after receiving bailout funds and just prior to completion of its acquisition by Bank of America. The outrage heightened following the revelation that AIG (which had received over €122 billion of federal bailout funds) was in the process of paying €121 million in "retention bonuses" to its executives.[1] The public anger over these payments – coupled with beliefs that Wall Street bonuses were a root cause of excessive risk taking that helped create the ongoing global financial crisis – led to an effective prohibition on cash bonuses for participants in the government's Troubled Asset Relief Program (TARP), and fueled calls for more-sweeping regulation of executive compensation.

The anger over bonuses paid by troubled financial institutions was not restricted to the USA. In March 2009, pressure mounted on both the French government to limit banking bonuses after the French bank Natixis SA revealed plans to pay its traders €70 million in bonuses for 2008.[2] In the same month, Germany's federal finance minister called for a return of Dresdner Bank's 2008 "obscene" bonuses.[3] In August 2009, both Germany and France announced new rules limiting banking bonuses, and French President Nicolas Sarkozy and urged leaders of the world's top 20 developed nations ("G20") to follow suit.[4] In early

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1 US dollar amounts converted to Euros at the 31 Dec 2008 exchange rate of 1:1.3919.

2 Moffett, "France Faces Pressure Over Bonuses As Natixis Sets $94.6 Million Payout," *The Wall Street Journal* (March 28, 2009), p. B5.

3 "Call for Dresdner execs to return bonuses get mixed response," *Banking Newslink* (March 31, 2009).

4 Smith, "Germany's BaFin Clamps Down On Bank Risk Mgmt, Bonuses," *Dow Jones International News* (August 14, 2009); Davies, "France announces bank bonus crackdown and urges G20 nations to follow suit,"

September 2009, the finance ministers of Sweden, the Netherlands, Luxembourg, France, Spain, Germany and Italy jointly demanded that banking bonuses be spread over several years, and called for an outright ban on bonus guarantees.[5] In addition, President Sarkozy was joined by United Kingdom (UK) Prime Minister Gordon Brown and German Chancellor Angela Merkel in demanding reforms of "reprehensible practices" within the global banking system.[6]

In November 2009, the UK adopted new rules requiring banks to publicly disclose the number of employees earning more than £1 million (€1.05 million). On 9 December, the British Government announced plans to impose a one-time 50% corporate tax on all banking bonuses above £25,000 (€26,250). Two days later, France imposed a similar one-time 50% corporate tax on banking bonuses above €27,500.[7]

The debate over banking bonuses and their alleged link to the 2008-2009 financial meltdown has focused attention on a controversial USA export to Europe: the Wall Street bonus culture. More broadly, concerns about compensation-induced excessive risk taking have focused attention on executive compensation practices throughout Europe and on another controversial USA export: the stock option. Once used only sparingly in the UK and France (and virtually non-existent in the rest of Europe), stock options and other forms of equity-based incentives are now prevalent features of executive compensation packages throughout Europe. Indeed, while not yet "catching up" with USA pay levels, compensation for European executives is becoming as complex and confusing as that of their transatlantic counterparts.

Executive compensation has been researched, scrutinized, and criticized for decades in the USA, and for a couple of decades in the UK, but has only recently come under close scrutiny in Continental Europe. Part of the newfound interest in executive pay in Europe reflects the fact that detailed data on executive pay practices have only recently become widely available. In particular, disclosure rules in the UK were expanded to include stock

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The Guardian (August 26, 2009), p. 23; "Germany backs calls to limit banker bonuses," *Agence France Presse* (August 28, 2009); "G-20 Leaders Near Bank-Pay Limits Amid Protests," *Associated Press* (September 24, 2009).

5 "G20 : Buzek Backs Calls to Limit Bankers' Pay," *Europolitics* (September 10, 2009).

6 Monaghan, "Brown sets out plan for bonus clampdown," *The Daily Telegraph* (September 4, 2009b), p. 1.

7 Castle, et al., "France joins U.K. to curb big bonuses by the banks; Combined assault aimed at pressuring others to limit financial institutions," *International Herald Tribune* (December 11, 2009), p. 4; Castle, et al., "France joins Britain in a levy on bonuses; United call for bank tax is meant to raise pressure on U.S. and other nations," *International Herald Tribune* (December 12, 2009), p. 11; Hall, "French government backs bonus windfall tax," (December 16, 2009).

option and equity grants only in 1997, and European Commission's similar disclosure recommendations for the rest of Europe were not promulgated until May 2003.[8]

The purpose of this study is to provide an overview of executive compensation and its controversies in the US and Europe. Our objective is to provide the tools, vocabulary, and context to assess past, current, and future controversies, separating politically driven criticisms from those reflecting real inefficiencies with executive pay levels and incentives. In the process, we will document the basic stylized facts relating to executive pay and its determinants for both European and American top executives.

Section 2 provides an introduction to executive compensation and traces its evolution, focusing on the USA experience. We begin by discussing how (and when) to measure executive pay, noting not only the distinction between expected and realized pay but also the distinction between the cost to the company of providing incentive compensation and the value of that compensation from the perspective of a risk-averse and undiversified executive. We then discuss alternative ways to measure the incentives from executive pay, and show how the level, composition, and pay-performance incentives have varied across time for USA CEOs. Given their historical importance in the USA and their increasing importance in Europe, particular attention is devoted to the evolution of stock options, which we argue were largely created and escalated by USA tax and accounting policies (rather than agency-theoretic considerations). Finally, we consider various theories explaining the dramatic increase in USA CEO pay that occurred from the mid-1980s to early 2000s, rejecting most explanations that ignore (or are inconsistent with) the fact that the pay inflation was driven almost entirely by the escalation in the use of stock options over this period.

Section 3 provides a comparative analysis of executive compensation in the USA and in ten European countries: Belgium, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland, and the UK. Our primary focus is on the firm's highest-ranking executive, and we refer to this individual as the chief executive officer (or CEO) regardless of whether the firm uses the CEO terminology or some other designation. We being by describing the level and determinants of CEO pay in each country (and for the USA vs. Europe collectively), and analyze cross-country differences in pay-size elasticities and sensitivities of changes in cash compensation to company performance. Next, we present

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8 The 1997 expansion of disclosure requirements in the U.K. followed the Greenbury (1995) and Hampel (1998) reports; see Conyon and Murphy (2000). The EC's recommended disclosure of executive pay policies as well as details of compensation for individual executives was part of its Company Law Action Plan of May 2003. While not legally binding, most large-capitalization companies complied with the EC recommendations (see RiskMetrics (2009)).

time-series evidence on the use of equity-based incentives in Europe, influenced in part by their importance in the USA. We then follow Conyon and Murphy (2000) and Fernandes, Ferreira, Matos and Murphy (2009) in isolating the "USA Pay Premium," finding that (1) USA CEOs receive significantly higher levels of pay than their European counterparts, even after controlling for company, industry, and personal characteristics; and (2) much (but not all) of the pay premium is explained by differences in the composition of pay (and, in particular, the intensive use of stock options and equity-based pay for USA CEOs). We consider a variety of cross-country (and cross-continent) agency-theoretic differences that might explain why the use of equity-based incentives is higher for USA CEOs. However, given our results in Section 2 (that the escalation in options in the USA was largely driven not by contracting efficiencies but rather by tax, accounting, and political considerations) coupled with the fact that there is not yet a true international labor market for managerial talent, we should not be surprised that path-dependence has led to different outcomes.

Finally, Section 4 focuses on the role of executive compensation and the banking bonus culture in causing or prolonging the 2008-2009 global financial crisis. We begin by tracing the evolution of compensation in financial services, and compare the compensation of USA bankers with that of their European counterparts. We then examine the two ways that compensation policies can promote excessive risk taking – convexities (i.e., asymmetries in the rewards for success and the penalties for failure) and performance measurement (e.g., paying mortgage brokers based on the number of mortgages they write, irrespective of whether the mortgages might be repaid) – and discuss how pay structures could be changed to mitigate incentives to take excessive risk. Next, we analyze whether incentives for top executives in banking indeed promoted excessive risk taking, showing that (at least in the US) the role of compensation was dwarfed by the roles of loose monetary policy, social housing policies, and financial innovations such as securitization and collateralized debt obligations. Finally, we discuss the predicted consequences of regulating or imposing punitive taxes on banking bonuses in both the USA and Europe.

2. A Primer on Executive Compensation: The USA Experience[9]

2.1. Introduction (and some history)

Executive compensation in the USA has evolved over time in response to tax policies, accounting rules, disclosure requirements, legislation, corporate governance, general economic conditions, and the political climate. Indeed, the current controversy over executive pay is not the first – nor will it be the last – time that executive compensation has sparked outrage and calls for regulation in the USA. Scrutinizing and criticizing high levels of executive pay has been an American pastime for nearly a century. In April 1932, for example, in the face of proposed bailout loans from the government's Reconstruction Finance Corporation (RFC), the Interstate Commerce Commission demanded that all railroads disclose executives making more than $10,000 per year (about €110,000 current euros).[10] In May 1933, Congressional pressure to limit railroad compensation, the RFC required railroad companies receiving government assistance to reduce executive pay by up to 60%.[11] Ultimately, the US Senate authorized the Federal Coordinator of Transportation to impose an informal (but uniformly complied with) cap of $60,000 per year (currently about €660,000) for all railroad presidents.

The Depression-era outrage over executive pay was not limited to the railroad sector. By mid-1933 the Federal Reserve began investigating executive pay in its member banks, the RFC conducted a similar investigation for non-member banks, and the Power Commission investigated pay practices at public utilities. In October 1933, the Federal Trade Commission required disclosure of salaries and bonuses paid by all corporations with capital and assets over $1 million (approximately 2,000 corporations).[12] Following the Securities Act of 1934,

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9 This Section draws from a variety of sources, including Jensen, et al. (2011) and Murphy (2011b). An expanded version of this Section will appear in Murphy (2011a).

10 "Railroad Salary Report: I.C.C. Asks Class 1 Roads About Jobs Paying More Than $10,000 a Year," *Wall Street Journal* (April 28, 1932), p. 2. "Current Euros" calculated by adjusting $10,000 by the change in the USA consumer price index between 1932 and 2009 (yielding $157,130) and converting to Euros using the December 2009 closing exchange rate (EUR = 1.4322 USD).

11 The required reductions ranged from 15% (for executives earning less than $15,000) to 60% (for executives earning more than $100,000. See "RFC Fixed Pay Limits: Cuts Required to Obtain Loans," *Los Angeles Times* (May 29, 1933), p. 1; "Cut High Salaries or Get No Loans, is RFC Warning," *New York Times* (May 29, 1933), p. 1.

12 See Robbins, "Inquiry into High Salaries Pressed by the Government," *New York Times* (October 29, 1933), p. 23 and "President Studies High Salary Curb: Tax Power is Urged as Means of Controlling Stipends in Big Industries," *New York Times* (October 23, 1933), p. 1. In addition to investigating corporate executive pay, President Roosevelt personally called attention to lavish rewards in Hollywood, resulting in a provision added to the "moving-picture code" that imposed heavy fines on companies paying unreasonable salaries.

the responsibility for enforcing pay disclosures for top executives in publicly traded corporations was consolidated into the newly created Securities and Exchange Commission (SEC). Under the Securities Act, details on executive pay are disclosed in company proxy statements issued in connection with the company's annual shareholders' meeting. Ultimately, these public disclosures of private compensation decisions have provided the fodder for all subsequent pay controversies. Proxy statements for companies with December fiscal closings are typically issued in late March or early April, triggering a deluge of pay-related articles in the popular and business press each Spring. *Forbes* and *Business Week* began offering extensive lists of the highest-paid executives in 1970. *Fortune* and the *Wall Street Journal* quickly followed suit, and by now most major newspapers conduct their own CEO pay surveys for companies based in their local metropolitan areas.

History repeated itself again in the takeover wave in the 1980s, when Congress took aim at Golden Parachutes paid to executives losing their jobs following a change in control. The controversy was sparked by a $4.1 million payment (currently about €6.4 million[13]) to William Agee, the CEO of Bendix. In 1982, Bendix launched a hostile takeover bid for Martin Marietta, which in turn made a hostile takeover bid for Bendix. Bendix ultimately found a "white knight" and was acquired by Allied Corp., but only after paying CEO Agee the Golden Parachute. The payment sparked outrage in Congress, which quickly introduced Section 280(G) of the tax code as part of the Deficit Reduction Act of 1984, imposing severe personal and corporate tax penalties on golden parachute payments exceeding three times the executive's average recent compensation. Ironically, although the cap was meant to reduce the generosity of parachute payments, the government action appeared to increase such payments: the new rules were followed by the introduction of golden parachutes (structured to satisfy the limits) in hundreds of companies that previously had no change-in-control agreements.

The CEO pay debate achieved international prominence in the early 1990s. The controversy heightened with the November 1991 introduction of Graef Crystal's (1991) exposé on CEO pay, *In Search of Excess*, and exploded following President George H. W. Bush's pilgrimage to Japan in January 1992 (accompanied by an entourage of highly paid US executives). What was meant to be a plea for Japanese trade concessions dissolved into accusations that US competitiveness was hindered by its excessive executive compensation

[13] Calculated by adjusting $4.1 million into 2009-inflation-adjusted US dollars (yielding $9.1 million) and converting to Euros based on the 2009 closing exchange rate.

practices as attention focused on the "huge pay disparities between top executives in the two countries."[14]

Consistent with *Time* magazine's labeling of CEO pay in 1992 as the "populist issue that no politician can resist,"[15] CEO pay emerged as a bipartisan campaign issue among the leading candidates in the 1992 presidential election.[16] Legislation was introduced in the House of Representatives disallowing deductions for compensation exceeding 25 times the lowest-paid worker, and the "Corporate Pay Responsibility Act" was introduced in the Senate to give shareholders' more rights to propose compensation-related policies. The SEC preempted the pending Senate bill in February 1992 by requiring companies to include non-binding shareholder resolutions about CEO pay in company proxy statements,[17] and announced sweeping new rules in October 1992 affecting the disclosure of top executive compensation in the annual proxy statement. In 1994, the Clinton tax act (IRS Section 162(m), passed as part of the Omnibus Budget Reconciliation Act of 1993) declared non-performance-related compensation in excess of $1 million as "unreasonable" and therefore not deductible as an ordinary business expense for corporate income tax purposes.[18]

Executive pay came into the spotlight again in the 2000s after the "burst" in the Internet bubble and the accounting scandals at companies such as Enron, Adelphia, WorldCom, Tyco, Computer Associates, and scores of other companies. While executives at these companies were awaiting trial or sentencing, another scandal emerged as academic researchers, the SEC, and the *Wall Street Journal* uncovered the practice of option-grant "backdating".[19] This practice involves falsifying company records so that options granted on one date are reported as granted on an earlier date when stock prices were unusually low. In particular, options that were reported as being granted with an exercise price equal to the grant-date market price were, in reality, granted at an exercise price below the market price on the actual grant date.

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14 "SEC to Push for Data on Pay of Executives," *Wall Street Journal* (January 21, 1992).

15 McCarroll, "The Shareholders Strike Back: Executive Pay," *Time*, (May 5, 1992).

16 "Politics and Policy—Campaign '92: From Quayle to Clinton, Politicians are Pouncing on the Hot Issue of Top Executive's Hefty Salaries," *Wall Street Journal* (January 15, 1992).

17 "Shareholder Groups Cheer SEC's Moves on Disclosure of Executive Compensation," *Wall Street Journal* (February 14, 1992).

18 The $1 million cap was not indexed to inflation, and converts to approximately €700,000 by 2009).

19 Heron and Lie (2006a); Heron and Lie (2006b); Lie (2005); Maremont, "Authorities probe improper backdating of options: Practice allows executives to bolster their stock gains; a highly beneficial pattern," *Wall Street Journal* (Nov. 11, 2005).

The backlash over CEO pay associated with the accounting and backdating scandals triggered additional rounds of pay-related legislation and regulation. Enacted in 2002, the Sarbanes-Oxley bill banned company loans to top executives and also required CEOs and CFOs to return ill-gotten bonuses and option gains following accounting restatements.[20] In 2004, as a direct response to Enron (where a small number of executives were allowed to withdraw millions of dollars from their deferred compensation accounts just prior to the company's bankruptcy), Congress added Section 409(A) to the Internal Revenue Code to limit the flexibility in the timing of elections to defer compensation. In 2006, the Financial Accounting Standards Board (FASB) began requiring firms to take an accounting charge for granting options, and the SEC adopted significant new disclosure rules for executive compensation affecting how (and what) compensation is disclosed and how companies must describe their compensation policies and practices.

The CEO pay controversies in 1933, 1982, 1992, 2006 and 2009 – and resulting calls for government action – share several common themes. First, all occurred in economic recessions or downturns that followed years of relative prosperity associated with large increases in executive compensation (and increases in USA income inequality more generally). Second, the controversies led to government action that was almost uniformly either ineffective or counterproductive, typically increasing (rather than reducing) CEO pay and leading to inefficiencies in pay practices. Finally, while the controversies have touched on legitimate issues concerning executive compensation, the most vocal critics of CEO pay (such as members of labor unions, disgruntled workers and politicians) have been uninvited guests to the table who have had no real stake in the companies being managed and no real interest in creating wealth for company shareholders.

In this Section, we will explore the evolution of CEO pay in the USA: if pay structures in the USA are indeed being imported into Europe, it is important to understand their genealogies. We begin with a challenging (and not completely satisfactory) discussion of how to *measure* CEO pay, a necessary component of any time-series. cross-sectional, or cross-country analysis. We then discuss the rise and fall of stock options in the USA, until recently the most important and distinctive component of executive compensation. Finally, we discuss the distinction between the "cost" of an executive compensation package from the standpoint of the employer (i.e., the shareholders), and the value of that same package from the standpoint of the risk-averse and undiversified executive. This distinction is critical in

[20] The Sarbanes-Oxley Act also essentially halted option backdating by requiring that option grants be reported within two days following the grant. This desirable outcome was an unintended (albeit positive) consequence of the Act, since the backdating scandal was not unearthed until after the Act was enacted.

comparing CEO pay across CEOs with different compensation structures, and understanding the incentives for both "effort" and risk created by incentive pay.

2.2. Measuring Executive Pay

Underlying every intra-firm, cross-sectional, cross-country, or time-series analysis of executive compensation is an assumption (too often implicit) about how to measure the total compensation received by the executives. If executives were simply paid a base salary set at the beginning of each year, it would be easy to compare salaries across executives (within a firm or across firms, industries, and countries) to identify the highest paid, to compare salaries across years to determine how pay has changed over time, and to compare executive salaries to wages paid in other occupations. But consider the following:

- Executives receive compensation in a dizzying array of forms, including base salaries, annual bonuses, long-term incentives, restricted stock, performance shares, stock options, retirement benefits, and perquisites ranging from health benefits to club memberships and personal use of the corporate jet.

- Many of these forms of compensation depend on performance measured over a single or multiple years, and it is not obvious how (or when) to measure them. For example, stock options (which give the executive the right, but not the obligation, to buy a share of stock at a predetermined price) typically have terms of up to ten years. Should stock options be "counted" as compensation when granted, or only when exercised?

- In addition, executives routinely receive lump-sum amounts at various points in time, such as signing bonuses when joining their firms, severance payments upon termination, and change-of-control payments when their companies are taken over. Moreover, some payments "earned" while employed (such as defined-benefit pension obligations) are not paid until long after the executive is retired and his compensation is no longer reported (or sometimes paid as a lump-sum upon retirement). Again, it is not obvious how, or when, to measure these aspects of compensation.

- Finally, different components of compensation impose different amounts of risk on executives. The payoffs from stock options, for example, are inherently more risky than are payoffs from restricted stock, which in turn are more risky than base salaries. Risk averse and undiversified executives will naturally place a lower value on riskier forms of compensation, and yet most studies of executive pay simply (and blindly) add together these different forms of compensation. The "risk premium" executives attach to different

forms of compensation depend on observable characteristics such as risk aversion and diversification, and it is not obvious how to add or how to weight the various components.

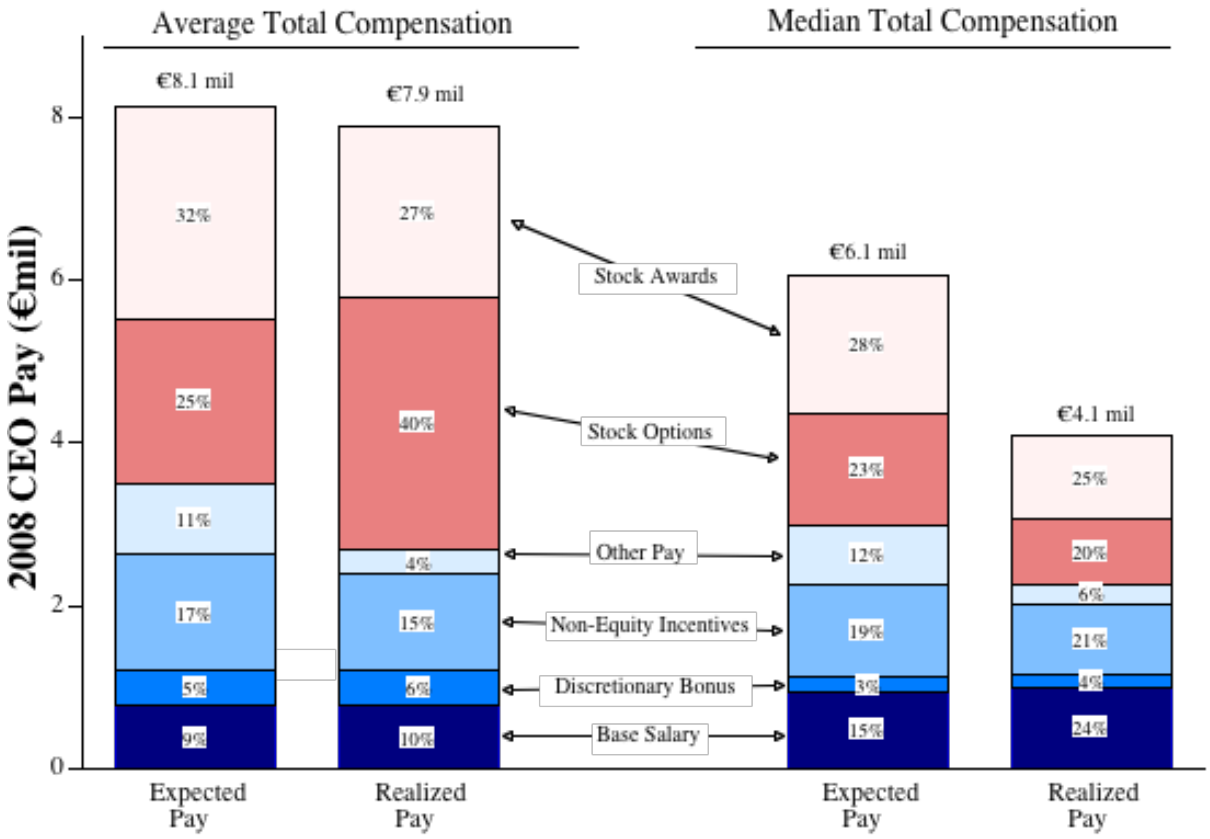
2.2.1. "Expected" vs. "Realized" Pay

Part of the confusion about how to measure executive pay reflects the distinction between "expected" and "realized" pay. Suppose, for example, that a CEO's compensation in 2007 and 2008 consisted of a salary of €500,000 paid each year and 50,000 shares of restricted stock awarded at the beginning of 2007 that become non-forfeitable ("vest") at the end of 2008. Suppose further that the company's stock price rose from €10 to €30 over the course of these two years. This CEO's expected pay (which includes the grant-date value of the restricted stock) was €1,000,000 in 2007 (consisting of the 2007 €500,000 base salary and the unvested stock with a grant-date value of €500,000) and the 2008 salary of €500,000. But, his realized pay (consisting of his base salary plus the amount realized upon vesting) was €500,000 in 2007 and €2,000,000 in 2008 (€500,000 in base salary plus €1,500,000 from the sale of his stock at the end of 2008).

Expected and realized pay are both legitimate measures of CEO compensation and each is a legitimate answer to a different question. Compensation committees evaluating the competitiveness of their CEO pay package at the beginning of the year (that is, before performance results are tallied) should focus on expected pay levels. In contrast, realized pay levels will (by definition) depend on the company's current and past performance, and are therefore most useful in evaluating whether ultimate rewards have been commensurate with company performance.

Another element of the confusion in describing the typical CEO pay package reflects the statistical distinction between averages and medians. Suppose, for example, that there are eleven CEOs in an industry, ten receiving compensation of €1 million and the eleventh receiving €12 million. The *average* compensation in this industry is €2 million (calculated by summing all compensation amounts and dividing by 11), while the *median* is only €1 million (calculated as the compensation where half the CEOs are paid more and half the CEOs are paid less). Average and median pay are, again, both legitimate measures of CEO pay, but are answers to different questions. Average pay is relevant in assessing aggregate levels of pay (a reader can multiply the average pay by the number of CEOs and get total compensation paid to all CEOs), while median pay is more relevant in describing compensation for a "typical" CEO.

Figure 2.1 2008 CEO Pay firms in the USA S&P 500



Note: Figure 2.1 is based on proxy statement information compiled in Standard & Poors' ExecuComp database for 496 S&P 500 firms with fiscal closings between June 2008 and May 2009. US Dollars converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

Expected Pay:

Base Salary and Discretionary Bonus reflects amounts *actually received for the fiscal year*
Non-Equity Incentives evaluated at target level (or average of minimum and maximum if target not reported)
Stock Options *evaluated at grant date using firm-estimated present value* (typically Black-Scholes (1973) calculations)
Stock Awards *evaluated at grant-date using firm-estimated present value* (typically grant-date market price)
Other Compensation includes perquisites, signing bonuses, termination payments, above-market interest paid on deferred compensation, and the change in the actuarial value of pension benefits.

Realized Pay:

Base Salary and Discretionary Bonus reflects amounts *actually received for the fiscal year*
Non-Equity Incentives defined as *payouts during the fiscal year* (including payouts on awards made in prior years)
Stock Options defined as *gains executive realized by exercising options during the fiscal year*
Stock Awards defined as *value of awards vesting during the fiscal year* (valued on the date of vesting)
Other Compensation includes perquisites, signing bonuses, termination payments, above-market interest paid on deferred compensation, and pension benefits paid during the year.

The percentages for Average Pay are calculated by dividing the average salary (for example) by average total compensation (or, equivalently, by dividing aggregate salaries by aggregate total compensation). The percentages for Median Pay are calculated as the average ratio of salary (again, for example) to total compensation for each CEO.

Figure 2.1 illustrates the 2008 expected and realized compensation for CEOs in firms listed in Standard and Poor's "S&P 500" (essentially the largest 500 USA firms ranked by market value). The data are based on fiscal 2008 proxy statement information reported in

Standard & Poors' ExecuComp database.[21] For both measures, total compensation is comprised of six basic components: base salaries; discretionary bonuses; non-equity incentives (based on both annual and multi-year performance measures); stock options; stock awards; and other pay. These six categories are designed to correspond to the SEC disclosure requirements effective as of December 2006. Under the prior disclosure requirements, firms separately reported "annual bonuses" and "payouts from long-term performance plans." Under the 2006 requirements, both annual cash bonuses from short-term incentive plans and long-term performance bonuses are considered "non-equity incentive compensation" if they are based on pre-established and communicated performance targets. If they are not based on pre-established and communicated targets the SEC (and us) treat them as discretionary bonuses.

Base salaries and the payouts from discretionary (non-formulaic) bonuses are the same for both expected and realized total compensation. However, the definitions of the remaining pay components vary with the measure utilized.

For *expected pay*, non-equity incentives are evaluated at the target level of payout (or, calculated as the average of the minimum and maximum payout if the target is not reported).[22] The expected value of stock options is defined as the company's estimate of the present value of the options on the grant date: this value is typically based on Black and Scholes (1973) or similar methodologies and approximates the amount an outside investor would pay for the option. Similarly, the expected value of stock awards is calculated as of the grant date using the grant-date market price, which in turn approximates the amount an outside investor would pay for the stock. "Other compensation" includes perquisites, signing bonuses, termination payments, and above-market interest paid on deferred compensation. In addition, "other compensation" includes the change in the actuarial value of pension benefits, which typically constitutes a large percentage of compensation for those executives with supplementary defined-benefit pension plans.[23]

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[21] We adopt the convention that companies with fiscal closings after May 31, in year "T" are assigned to fiscal year "T" while companies with fiscal closings on or before May 31, Year "T" are assigned to fiscal year "T-1". Thus, the 2008 fiscal year includes companies with fiscal closings between June 1, 2007 and May 31, 2008.

[22] The actual payouts during the year are used as an estimate for expected non-equity incentives in firms without reported targets or caps.

[23] The "change in the actuarial value of pension benefits" is the year-to-year change in the actuarial present value of the CEO's accumulated benefit under all defined benefit and actuarial pension plans, assuming a normal retirement age as defined in each company's plan (or, if not so defined, the earliest time at which the

For *realized pay*, non-equity incentives are defined as actual payouts during the fiscal year, including both amounts paid in formula-based annual bonus plans, and current-year payouts from longer-term plans. Stock options are calculated as the gains realized by exercising options during the year, and stock awards are calculated as the value of the stock (or other equity instruments) as of the vesting date. Other compensation includes perquisites, signing bonuses, termination payments, above-market interest paid on deferred compensation, and the actual payments made to the CEO during the year under pension or retirement plans.

The first two columns in Figure 2.1 depict *average* Expected and Realized compensation. The average *Expected* Compensation for CEOs in S&P 500 firms in 2008 was €8.1 million, compared to average *Realized* Compensation of €7.9 million. Stock awards are the largest single component of Expected pay in 2008, while gains from exercising options are the largest single component of Realized pay. The difference between the expected and realized largest component reflects the recent shift away from option grants towards grants of restricted stock: the realized amounts reflect gains from options granted up to ten years earlier (when option grants were the dominant form of compensation) and vesting value of restricted stock typically granted three to five years earlier (when stock grants were not as important). The "Other Pay" component of expected pay is large compared to the corresponding component for realized pay, reflecting that the definition of expected pay includes the (generally positive) change in the actuarial present value of pension benefits during the year. In contrast, the realized pay for pensions include only pension benefits paid during the year for proxy-named executives (which excludes amounts paid after retirement).

The remaining two columns in Figure 2.1 depict median compensation. Median compensation is typically lower than average pay, since a small number of very-highly paid CEOs will increase the average pay but not the median pay. For example, Occidental's Ray Irani realized €132 million by exercising options in 2008. If he had not exercised the options, his pay would have fallen to "only" €27.5 million, and the average realized compensation for the 496 executives in Figure 2.1 would decrease nearly €300,000 from €7.9 million to €7.6 million, but the median would not change (because Mr. Irani's pay would have remained well above the €4.1 million median). Equity awards for the median executive are fairly evenly split between option awards and stock awards for both measures

CEO may retire under the plan without any benefit reduction due to age). The pension information in Figure 1 was first available in 2006, and these amounts are therefore excluded in our historical analyses below.

of total compensation, and together option and stock awards comprise about half of total compensation for the typical executive.

Figure 2.2 shows how the average and median total expected compensation for CEOs has evolved from 1970 to 2008. Because of the "skewness" in the pay distribution (where a small number of CEOs receive unusually high levels of compensation), the average pay exceeds the median pay in each year. Due to changing reporting requirements and data availability some of our estimates of expected compensation are approximations, but we are comfortable that the trends depicted in Figure 2.2 are historically representative.[24] The data are adjusted for inflation to 2008-constant dollars, and then converted to Euros at the year-end 2008 exchange rate. As shown in the figure, average expected compensation increased from about €800,000 in 1970 to €7.3 million in 2008, down from a peak of over €10 million in 2000; median expected compensation peaked at €6.4 million in 2001, falling to €5.4 million in 2008. The escalation in CEO pay has far outpaced wage gains for production workers: in 1970, the average CEO made 31 times the wages of the average production worker (while the median CEO made 26 times more); by 2008 the average CEO made 325 times the wages of production workers (while the median CEO made 240 times more).[25]

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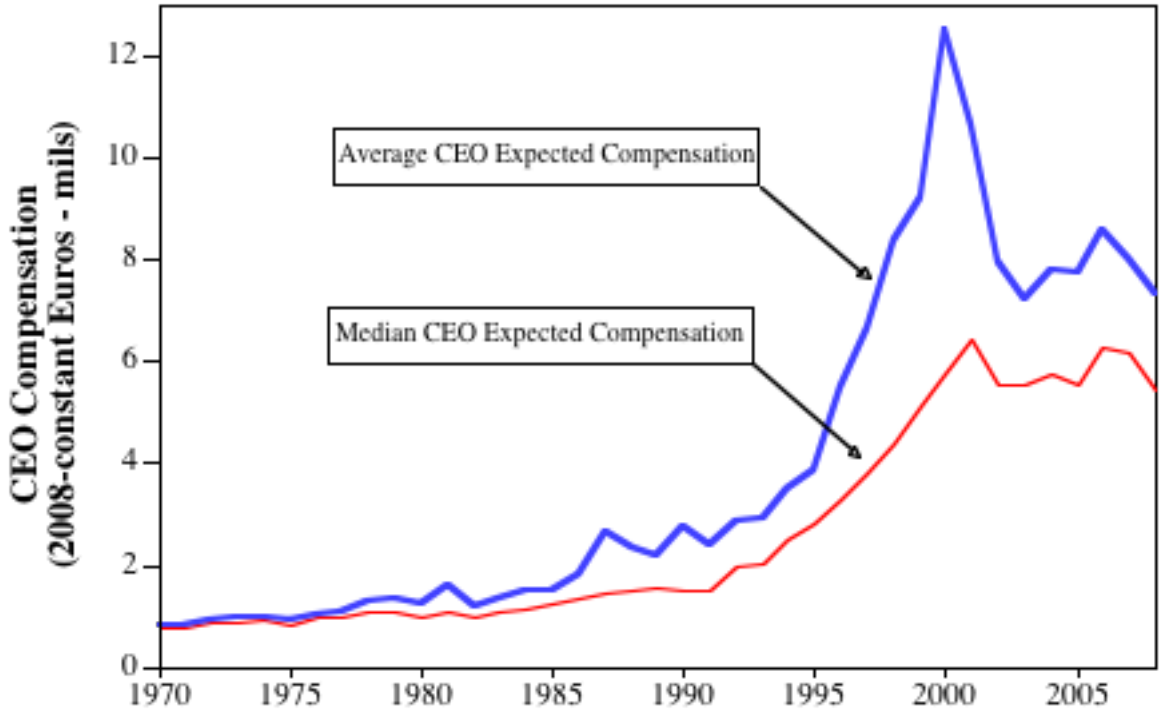
[24] Non-equity incentive pay is based on actual payouts rather than targets since target payouts were not reported prior to 2006. Stock awards for 1992-2006 are measured at grant-date values. Option awards are measured using company fair-market valuations, when available, and otherwise using ExecuComp's modified Black-Scholes approach. Average and (median) equity compensation prior to 1978 estimated as 11.2% and (0%) of total pay (based on Murphy (1985), equity compensation from 1979 through 1991 estimated as amounts *realized* from exercising stock options during the year, rather than grant-date values. Using the amounts realized from the exercise of options (rather than the value of options granted) from 1978 to 1991 is also not expected to impose a large bias in the general trend in options and compensation. Indeed, Frydman and Saks (2005) show that trends based on grants and exercises were nearly indistinguishable during this period. In addition, Hall and Liebman (1998) analyze trends in grant-date option values during the 1980s and document a very similar pattern to that shown in Figure 2.2.

[25] USA production worker pay is from the Current Population Statistics issued by the Bureau of Labor Statistics (www.bls.gov/ces/home.htm, Table B2), and equals the average hourly earnings of production workers multiplied by 52 times the average weekly hours for such workers. Total compensation for both executives and production workers excludes company-provided benefits such as health insurance, social security taxes, etc. The ratios of CEO to worker pay are overstated to the extent that these excluded benefits represent a larger percentage of compensation for workers than for CEOs. Total compensation for production workers excludes the value of option grants to production workers, and this also leads to an overstatement of the ratio of CEO to worker pay.

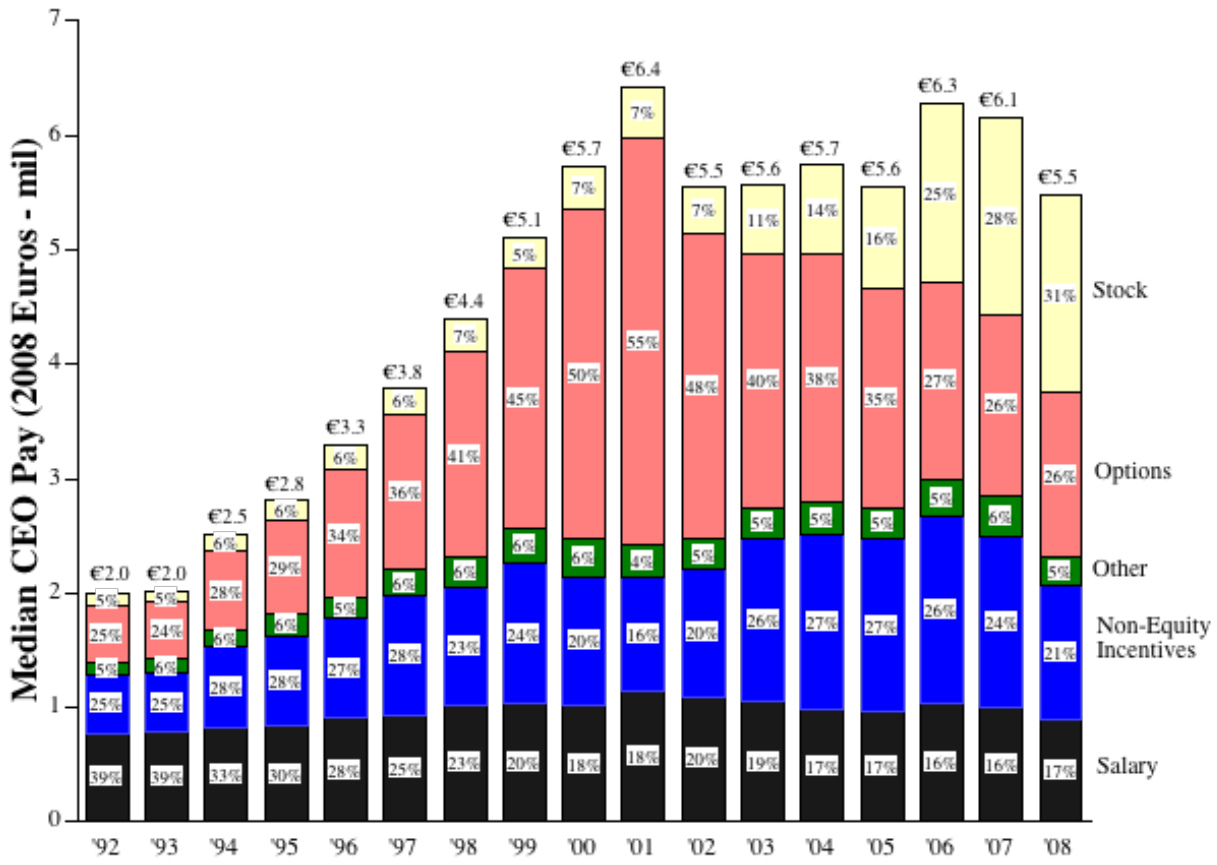
Figure 2.2 Average and Median Expected Compensation for CEOs in USA S&P 500 Firms, 1970-2008



Note: Compensation data are based on all CEOs included in the USA S&P 500, using data from *Forbes* and ExecuComp. CEO total pay includes cash pay, restricted stock, payouts from long-term pay programs and the value of stock options granted (using company fair-market valuations, when available, and otherwise using ExecuComp's modified Black-Scholes approach). Average (median) equity compensation prior to 1978 estimated as 11.2% (and 0%) of total pay (based on Murphy (1985), equity compensation from 1979 through 1991 estimated as amounts *realized* from exercising stock options during the year, rather than grant-date values. Non-equity incentive pay is based on actual payouts rather than targets, since target payouts were not available prior to 2006. Monetary amounts are converted to 2008-constant US dollars using the Consumer Price Index, and then converted to Euros using the 2008 year-end exchange rate.

The 2008 average and median in Figure 2.2 (€7.3 mil and €5.4 mil) are considerably smaller than the average and median in Figure 2.1 (€8.1 mil and €6.1 mil). This difference largely reflects that Figure 2.1 includes the change in the actuarial value of pension benefits, a component of compensation that was not disclosed or reported before 2006. Another difference – but relatively immaterial – is that Figure 2.1 includes the "target" rather than realized payouts from bonuses and other non-equity incentive plans; these data also became available after the 2006 revisions in disclosure rules. To maintain comparability in both our time-series results and (in the next Section) our USA vs European comparisons, Figure 2.2 and the results hereafter exclude pensions and uses payouts rather than targets for non-equity incentive plans.

Figure 2.3 Median Expected Compensation for CEOs in USA S&P 500 Firms, 1992-2008



Note: Median pay levels based on ExecuComp data for S&P 500 CEOs. Total compensation (indicated by bar height) defined as the sum of salaries, non-equity incentives (including bonuses), benefits, stock options (valued on the date of grant using company fair-market valuations, when available, and otherwise using ExecuComp's modified Black-Scholes approach), stock grants, and other compensation. "Other compensation" excludes pension-related expenses. Pay composition percentages defined as the average composition across executives. Monetary amounts are converted to 2008-constant US dollars using the Consumer Price Index, and then converted to Euros using the 2008 year-end exchange rate.

Figure 2.3 shows the composition and level of pay for the *median* CEO in S&P 500 firms from 1992 to 2008. The Euro-denominated data are again constructed by first adjusting for inflation (using the US Consumer Price Index), and then converting to Euros using the 2008 year-end exchange rate. The pay composition percentages in the figure are constructed by first calculating the composition percentages for each CEO, and then averaging across CEOs. In 1992, base salaries accounted for 39% of the €2.0 million median CEO pay package, while stock options (valued at grant date) accounted for 25 percent. By 2001, base salaries accounted for only 18% of the median €6.4 million pay, while options accounted for more than half of pay. By 2008, options fell to only 26% of pay, as many firms switched from granting options to granting restricted stock (which swelled to 31% of pay).

2.2.2. The "Cost" vs. the "Value" of Incentive Compensation

In constructing measures of total compensation, it is important to distinguish between two often-confused but fundamentally different valuation concepts: the cost to the company of granting the compensation and the value to an executive from receiving the compensation. Consider, for example, a company that decides to give a share of restricted stock to its CEO vesting in five years (that is, the CEO is restricted from selling the share of stock for five years, and receives the accumulated dividends (plus interest) upon vesting). Suppose further that the market price of a share of stock is €10. The economic or opportunity cost of the stock grant to the company is the amount the company could have received if it were to sell an unrestricted share to an outside investor rather than giving the restricted share to the CEO. Ignoring the slight dilution discount associated with issuing a new share, the company could raise €10 by selling the share to an outside investor. Thus, the company's cost of granting the share is the price of the share on the open market.

Alternatively (but equivalently), by granting the restricted share to the CEO, the company is effectively promising to deliver one share of stock to the CEO in five years. If the company had no shares available to issue, it could satisfy this contract by purchasing a share on the open market in five years at a price that might be higher or lower than €10. If the company wanted to perfectly hedge the "price risk" of its future obligation, it could purchase a share of stock in the open market today (for €10) and deliver it to the CEO it to the CEO in five years. Thus, again, the company's cost of granting the share is simply the price of the share on the open market.

But, what about the CEO? The CEO would clearly prefer to have €10 today than a promise to receive one share of stock in five years; after all, he could always take the €10 and *buy* a share of stock today, but will likely have other more-preferred uses for the €10. Moreover, if the CEO is risk averse and undiversified (in the sense that his overall wealth is positively correlated with company stock prices, through existing stock ownership, option holdings, and the risk of being fired for poor performance), the value the CEO places on the share of restricted stock will be strictly less than the fair market value of the share. Moreover, the CEO's value will predictably decrease as the CEO becomes more risk averse or less diversified.

Similarly, suppose that the company decides to give a stock option to the CEO. The opportunity cost of granting the option is the amount an outside investor would pay for it. The outside investor is generally free to trade the option, and can also take actions (such as short-selling the underlying stock) to hedge away the risk of the option. Black and Scholes

(1973) and Merton (1973) demonstrated that, since investors can hedge, options can be valued as if investors were risk neutral and all assets appreciate at the risk-free rate. This risk-neutrality assumption forms the basis of option pricing theory and is central to all option pricing models, including binomial models, arbitrage pricing models, and Monte Carlo methodologies. Ignoring dilution, forfeiture, and early exercise (more on these later), these now-standard methodologies provide reasonable estimates of what an outside investor would pay, and therefore measure the company's cost of granting options.

However, Black-Scholes values do not measure the value of the non-tradable option to a risk-averse executive. In contrast to outside investors, company executives cannot trade or sell their options, and are also forbidden from hedging the risks by short-selling company stock. In addition, while outside investors tend to be well-diversified (holding small amounts of stock in a large number of companies), company executives are inherently undiversified, with their physical as well as human capital invested disproportionately in their company. For these reasons, company executives will generally place a much lower value on company stock options than would outside investors.

Lambert, Larcker and Verrecchia (1991) and Hall and Murphy (2002) propose measuring the value of a non-tradable option to an undiversified risk-averse executive as the amount of riskless cash compensation the executive would exchange for the option.[26] Suppose that an executive has non-firm-related wealth of w, holds a portfolio $S(\bullet)$ of company shares and options, and is granted n options to buy n shares of stock at exercise price X in T years. Assuming that w is invested at the risk-free rate, r_f, and that the realized stock price at T is P_T, the executive's wealth at time T is given by

$$W_T \equiv w(1+r_f)^T + s(P_T) + n \bullet max(0, P_T - X). \quad (1)$$

If, instead of the option, he were awarded V in cash that he invested at the risk-free rate, his wealth at time T would be:

$$W_T^V \equiv (w+V)(1+r_f)^T + s(P_T). \quad (2)$$

[26] Meulbroek (2001) measures the value:cost "inefficiency" of options using a completely different (non-utility-based) but complementary approach. Her method enables her to make precise estimates of what she calls the "deadweight cost" of option grants without knowledge of the specific utility function or wealth holdings of executives. Her approach produces a lower bound estimate of the value:cost inefficiency since her goal is to isolate the deadweight cost owing to sub-optimal diversification, while abstracting from any additional deadweight cost from the specific structure of the compensation contract.

Assuming that the executive's utility over wealth is $U(W)$, we can define the executive's value of n options as the "certainty equivalent" V that equates expected utilities (1) and (2):

$$(3) \qquad \int U(W_T^V) f(P_T) dP_T \equiv \int U(W_T) f(P_T) dP_T.$$

Solving (3) numerically requires assumptions about the form of the utility function, $U(W)$, and the distribution of future stock prices, $f(P_T)$. We follow Hall and Murphy (2002) in assuming that the executive has constant relative risk aversion ρ, so that $U(W) \equiv ln(W)$ when $\rho=1$, and $U(W) \equiv \frac{1}{1-\rho} W^{1-\rho}$ when $\rho \neq 1$. We adopt the Capital Asset Pricing Model (CAPM) and assume that the distribution of stock prices in T years is lognormal with volatility σ and expected value equal to $(r_f + \beta(r_m - r_f) - \sigma^2/2)T$, where β is the firm's systematic risk and r_m is the return on the market portfolio.[27]

More to come: Compute risk-adjusted pay for 2008; compare trend lines in risk-adjusted and non-adjusted pay.

2.3. Measuring Executive Incentives

Conceptually, the incentives created by any compensation plan are determined by two factors: (1) how performance is measured; and (2) how compensation (or wealth) varies with measured performance. Most of the executive compensation literature has focused on the relation between CEO and shareholder wealth (or, what Jensen and Murphy (1990b) defined as the pay-performance sensitivity), where CEOs with higher pay-performance sensitivities are defined as having better incentives to create shareholder value. Therefore, we begin this section with an analysis of different ways to measure incentives executives have to increase shareholder wealth. Next, given the recent focus on excessive risk taking many believe contributed to the financial crisis, we consider two measures of the incentives executives have to increase stock-price volatilities. Finally, we discuss a variety of other incentive problems not neatly encapsulated in pay-performance or pay-volatility sensitivities, such as incentives to smooth or manage earnings or to pursue short-run profits at the expense of long-run value.

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[27] For tractability, we assume that the distribution of future stock prices is the same whether the executive receives options or cash. If the grant provides incentives that shift the distribution, and if the shift is not already incorporated into stock prices as of the grant date, we will underestimate both the cost and value of the option.

2.3.1. The Relation Between CEO and Shareholder Wealth

Most research on CEO incentives has been firmly (if not always explicitly) rooted in agency theory: compensation plans are designed to align the interests of risk-averse self-interested CEOs with those of shareholders. Following this framework, most of the focus has been on the relation between CEO compensation (or CEO wealth) and changes in firm value. The most direct linkage between CEO and shareholder wealth comes from the CEO's holdings of stock, restricted stock, and stock options. However, CEO wealth is also indirectly tied to stock-price performance through accounting-based bonuses (reflecting the correlation between accounting returns and stock-price performance), through year-to-year adjustments in salary levels, target bonuses, and option and restricted stock grant sizes, and through the threat of being fired for poor performance. The CEO pay literature has yet to reach a consensus on the appropriate methodologies and metrics to use in evaluating the "indirect" relation between CEO pay and company stock-price performance. Fortunately, Hall and Liebman (1998) and Murphy (1999) show that virtually all of the sensitivity of pay to corporate performance for the typical CEO is attributable to the direct rather than the indirect part of the CEO's contract, and the direct part can be measured from information available in USA proxy statements.

Since agency costs arise when agents receive less than 100% of the value of output, the CEO's share of ownership is a natural measure of the severity of the agency problem. In particular, the CEO's percentage holdings of his company's stock measures how much the CEO gains from a €1 increase in the value of the firm, and how much he loses from a €1 decrease. Computing percentage ownership for restricted and unrestricted shares is trivial (simply divide by the total number of shares outstanding). Including stock options in a percentage holdings measure is more complicated, since options that are well out-of-the-money provide few incentives to increase stock prices, while options that are well in-the-money provide essentially the same incentives as holding stock. Therefore, each stock option should count somewhat less than one share of stock when adding the holdings to form an aggregate measure of CEO incentives, and the "weight" should vary with how much the option is in (or out) of the money. In constructing our aggregate measure of CEO incentives, we weight each option by the "Option Delta," defined as the change in the value of a stock option for an incremental change in the stock price. Option Deltas – described more formally in the Appendix to this Section – range from near zero (for deep out-of-the-money options)

to near one (for deep in-the-money options on non-dividend paying stock).[28] We call our measure the "effective ownership percentage" to distinguish it from the actual ownership percentage based only on stock (and not option) holdings.

Figure 2.4 shows the evolution of the median effective percentage ownership for CEOs in USA S&P 500 firms from 1992-2008. The percentage ownership for stock and restricted stock is calculated by dividing the CEO's shareholdings by the total number of shares outstanding. Effective percentage ownership for stock options is measured by weighting each option held by the executive at the end of the fiscal year by "Option Delta" for that option (which varies according to the exercise price and time remaining to exercise), and dividing by the total number of shares outstanding.[29] As shown in the figure, stock and restricted stock holdings for the median S&P 500 executive have grown from 0.14% in 1992 to 0.18% in 2008. Over the same time period, total effective ownership (including delta-weighted options) doubled from 0.37% in 1992 to 0.73% in 2003, before falling to 0.38% in 2008. The drop in ownership in 2008 primarily reflects that most options held by USA CEOs at the end of 2008 were substantially out of-the-money and therefore had low incentives and low Option Deltas.

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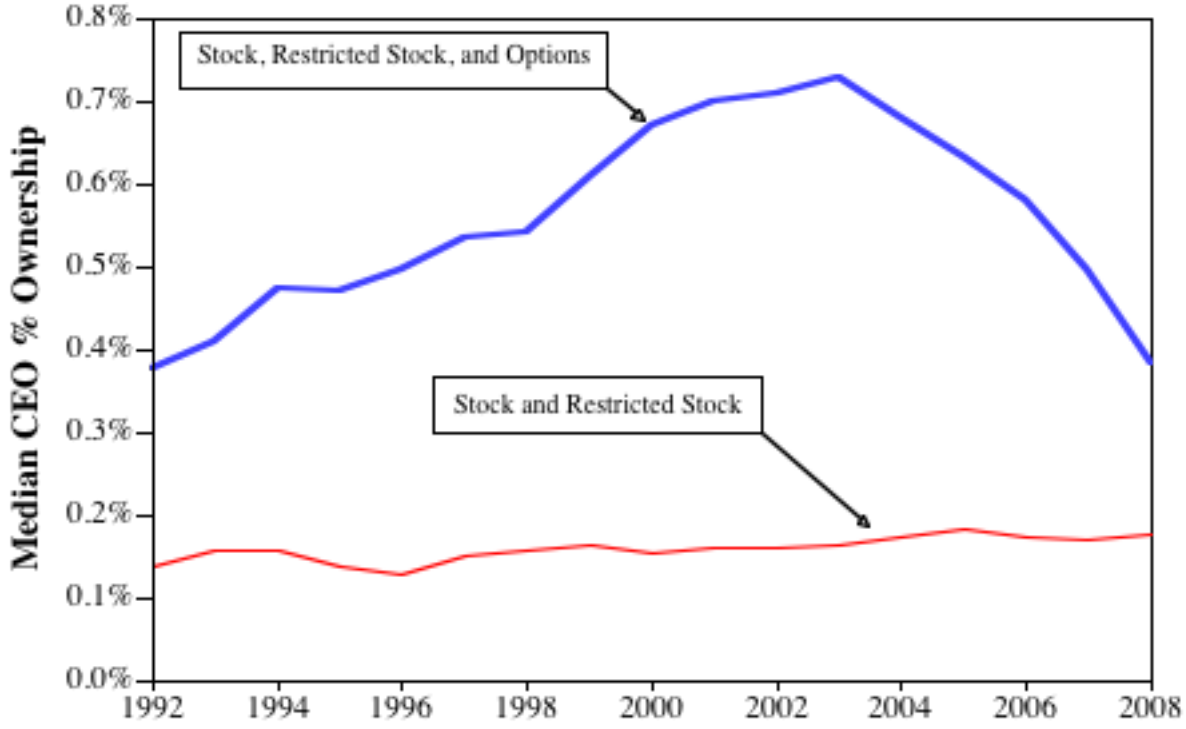
[28] The percentage option holdings multiplied by the option delta is a measure of the change in CEO option-related wealth corresponding to a change in shareholder wealth. More formally, suppose that the CEO holds N options, and suppose that shareholder wealth increases by €1. If there are S total shares outstanding, the share price P will increase by $\Delta P = €1/S$, and the value of the CEO's options will increase by $N\Delta P(\partial V/\partial P)$, where V is the Black-Scholes value of each option, and $(\partial V/\partial P)$ is the option delta. Substituting for ΔP, the CEO's share of the value increase is given by $(N/S)(\partial V/\partial P)$, or the CEO's options held as a fraction of total shares outstanding multiplied by the "slope" of the Black-Scholes valuation. For examples of this approach see Jensen and Murphy (1990a), Yermack (1995), and Murphy (1999). Hall and Murphy (2002) offer a modified approach to measure the pay-for-performance incentives of risk-averse undiversified executives. An alternative approach, adopted by Jensen and Murphy (1990b), involves estimating the option pay-performance sensitivity as the coefficient from a regression of the change in option value on the change in shareholder wealth.

[29] USA proxy disclosure rules effective since December 2006 provide the details on year-end option holdings required to estimate Options Deltas. Year-end holdings prior to 2006 are estimated using the procedure in Murphy (1999).

Figure 2.4 Median Effective Percentage Ownership for CEOs in USA S&P 500 Firms, 1992-2008

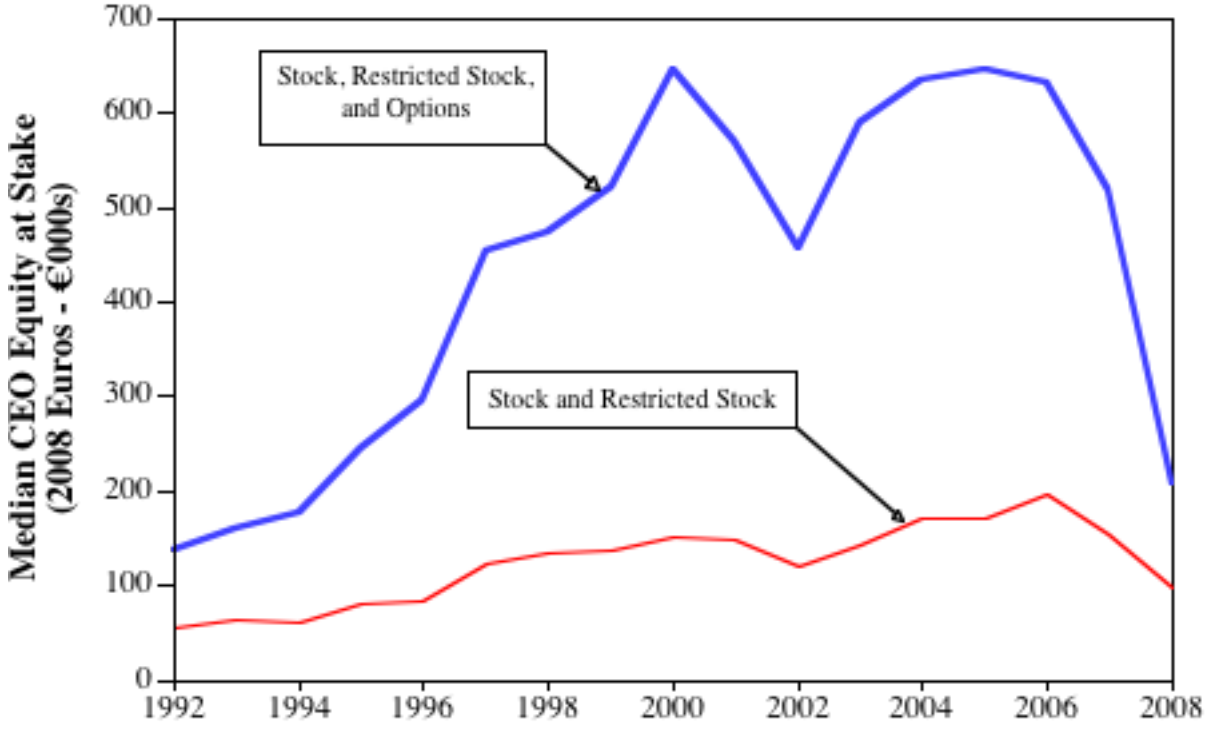


Note: Percentage ownership for stock and restricted stock measured as the CEO's shareholdings divided by the total number of shares outstanding. Effective percentage ownership for stock options measured by weighting each option held by that options "Black-Scholes Delta" and dividing by the total number of shares outstanding. Year-end options under the pre-2006 disclosure rules estimated using the procedure in Murphy (1999).

Our measure of effective CEO ownership is essentially the "Pay-Performance Sensitivity" introduced by Jensen and Murphy (1990b). The primary difference is that we have measured the effective ownership percentage, while Jensen and Murphy measured the change in CEO wealth per $1,000 change in shareholder wealth, which equals the effective ownership percentage multiplied by ten. The other difference is that Jensen and Murphy also include indirect incentives from cash compensation and disciplinary terminations. Using data from 1974-1986, Jensen and Murphy estimate a median pay-performance sensitivity for stock and options of $2.50 for every $1,000 change in shareholder wealth, which corresponds to an ownership percentage of 0.250%.[30] Therefore, by the end of 2003 pay-performance sensitivities had nearly tripled from 1974-1986. But, by year-end 2008 the pay-performance sensitivity was essentially at its 1992 level, or about 50% higher than the Jensen-Murphy estimate.

[30] Including incentives from potential dismissals and performance-related changes in the value of salaries, bonuses, and option grants, increased the "final" Jensen-Murphy estimate to $3.25 per $1,000, or an effective ownership percentage of 0.250%.

Figure 2.5 Median "Equity at Stake" for CEOs in USA S&P 500 Firms, 1992-2008



Note: Following Frydman and Jenter (2010), Equity-at-Stake is measured as the effective ownership percentage multiplied by 1% of the firms market capitalization (in thousands of 2008-constant Euros).

The average market capitalization of firms in the USA S&P 500 grew from €22 billion in 1992 to €61 billion in 2007 (before falling to €47 billion in 2008), therefore the dollar value of the typical CEOs ownership position is large even if his percentage holding is low. Hall and Liebman (1998) argue that a better way to measure CEO incentives is as the change in CEO wealth for a 1% change in the value of the firm rather than as the ownership percentage. Baker and Hall (2004) provide some theoretical justification for using this measure. In particular, Baker and Hall show that percentage ownership is the right measure of incentives when the marginal product of the CEO effort is constant across firm size, such as a CEO contemplating a new corporate headquarters that will benefit the CEO but perhaps not the shareholders, or an outside takeover bid that will benefit outside shareholders but perhaps not the CEO. But, the Hall-Liebman measure is the appropriate when the marginal product of the CEO effort scales with firm size, such as a corporate reorganization (assuming it takes the same amount of CEO effort to reorganize a big firm than a small firm).

Figure 2.5 shows the evolution of the Hall-Liebman measure – what Frydman and Jenter (2010) call "equity at stake" – from 1992 to 2010. The equity at stake measure is calculated as 1% of the effective ownership percentage multiplied by the firm's market

capitalization.[31] In 1992, each 1% change shareholder wealth resulted in a €137,000 change in CEO wealth for the median CEO in the S&P 500. The equity-at-stake measure grew to nearly €650,000 in 2000 and again in 2005, before plummeting to €207,000 as a result of both the decline in market capitalizations and the decline in Option Deltas.

2.3.2. The Relation Between CEO Wealth and Stock-Price Volatilities

Suspicions that executive compensation policies in financial services firms contributed to the 2008-2009 financial crisis eventually broadened to similar suspicions for companies outside the financial sector. In December 2009, as part of the continued fallout from the crisis, the SEC began requiring all publicly traded companies to disclose and discuss compensation policies and practices that might provide incentives for executives to take risks that are reasonably likely to have a material adverse effect on the company.

As discussed in detail in Section 4, there are two ways that executive compensation policies promote risk taking: (1) through convexities in the pay-performance relation (e.g., providing rewards for success without penalties for failure), and (2) performance measurement (e.g., rewarding loan officers on the quantity of loans they write rather than the quality, i.e., the probability that the loans might actually be repaid). For top executives rewarded primarily with equity-based compensation, the primary source of risk-taking incentives emanates from stock options. The pay-performance relation implicit in stock options is inherently convex, since executives receive gains when stock prices exceed the exercise price, but their losses when the price falls below the exercise price are capped at zero. Thus, the value of a stock option increases monotonically with stock-price volatilities, which provides an incentive for executives to take risks that increase such volatilities.

In Section 2.3.1, our calculations for pay-performance sensitivities for stock options depended on the Option Delta, defined as the change in the value of a stock option associated with change in the stock price. Similarly, our calculations for pay-volatility sensitivities for stock options depend on the Option Vega, typically defined as the change in the value of a stock option associated with one percentage-point increase in the stock-price volatility (e.g., from 30% to 31%). Option Vegas – defined formally in the Appendix to this Section – are typically highest when stock prices are near the option's exercise price.

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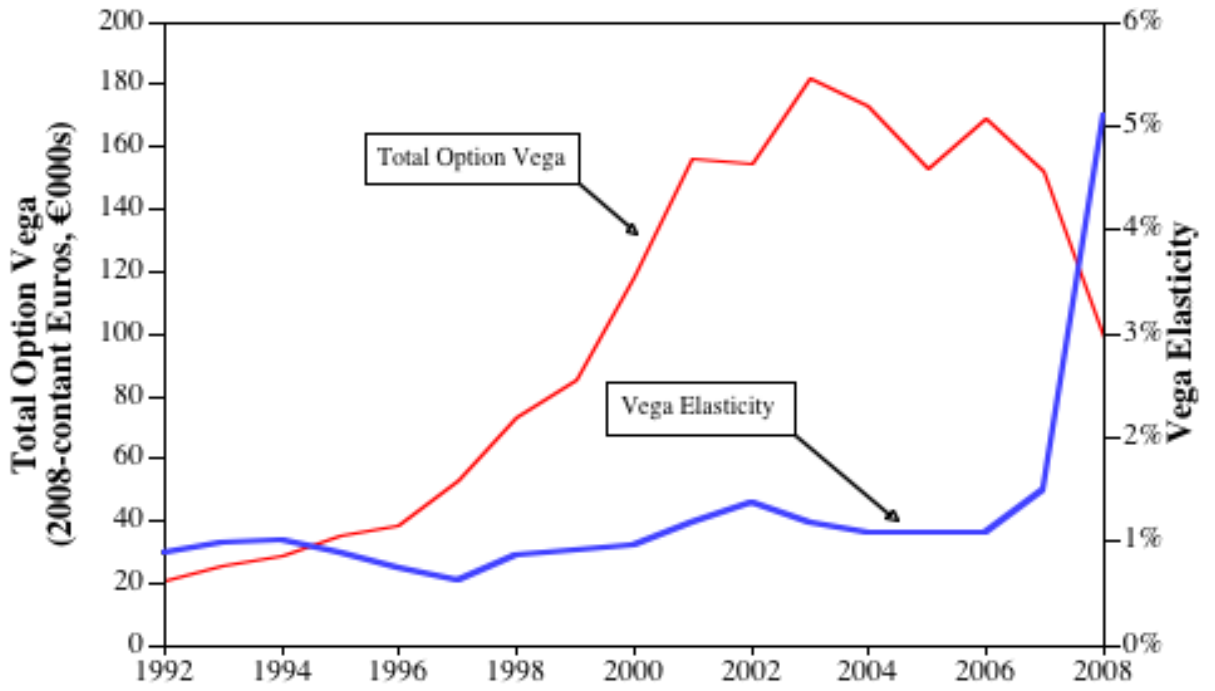
[31] Suppose that the CEO holds M shares and N options. If the share price P increases by 1%. If there are S total shares outstanding, the value of the CEO's portfolio will increase by $.01P(M+N(\partial V/\partial P))$ or $.01(PS)[(M+N(\partial V/\partial P))/S]$, where PS is the firm's market capitalization and the quantity in the square brackets is our equation for the CEO's effective ownership percentage.

Figure 2.6 Option-based incentives to increase volatility by CEOs in USA S&P 500 Firms, 1992-2008



Note: ???

Following Fahlenbrach and Stulz (2010)'s analysis of executive compensation and the financial crisis, we consider two option-based measures for incentives to increase stock-price volatilities:

Total Option Vega = Change in value of outstanding options for a one percentage-point increase in volatility.

Vega Elasticity = Percentage change in value of outstanding options for a one percentage-point increase in volatility.

Figure 2.6 shows the time trends in our two measures of pay-volatility sensitivities for the median executive in a USA S&P 500 firm from 1992-2008. The left-hand axis reports the Total Option Vega, which reached its peak in 2003 (when the median CEO gained €182,000 by increasing volatility by one percent), and plummeted in 2008 to less than €100,000 for a one percent increase in volatility. The right-hand axis reports the percentage change in option values associated with a one percent increase in volatility. This "Vega Elasticity" remained relatively constant from 1992 to 2007 at around 1.0 (indicating that a one percentage-point increase in volatility would increase the value of CEO option holdings by about 1%), when it increased to over 5.0.

The differences in our two measures in Figure 2.6 reflect the effect of stock-market movements and, in particular, the market crash at the end of 2008. When stock prices fell (as they did abruptly in 2008, across all sectors of the USA economy), the options fell out of the money, which implies that the Option Vega for each option becomes smaller (remember that the Option Vega is highest when the stock price is close to the exercise price). But, it turns out that, as stock prices fall, the value of the options held fall even faster than the Option Vega. As a result, the value of options that are out-of-the-money increase more in percentage terms (but less in dollar or euro terms) as volatility increases.

There is no accepted methodology on measuring incentives for risk in executive option portfolios, or in executive contracts more generally. Until the recent financial crisis – when compensation policies were blamed for contributing to the meltdown – there had been little focus on the role of compensation policies in providing incentives to take risks. Indeed, the normative challenge in the optimal compensation literature based on risk-averse executives and (essentially) risk-neutral principals has been on how to provide incentives to these executives to take enough risks, and not too many risks.

2.4. Equity-Based Incentives for USA CEOs

No analysis of executive compensation in the USA is complete without a careful analysis of its defining components: executive stock options and restricted stock. Indeed, the escalation and subsequent decline of total compensation for S&P 500 CEOs evident from Figure 2.2 and Figure 2.3 is largely (but not entirely) explained by an explosion in stock option grants beginning in the mid-1980s, and the "leveling off" of pay since 2001 masks a dramatic switch from options towards restricted stock. The average grant-date Black-Scholes value of options to S&P 500 CEOs (in 2008-constant dollars, converted to Euros) soared from about €70,000 in 1970 to €8.4 million in 2000,[32] falling to €2 million by 2008. The average grant-date value of restricted stock to S&P 500 CEOs was negligible until the early 1990s, growing to €2.6 million by 2008.

Over the past decade, several researchers have analyzed and attempted to explain the dramatic rise in CEO pay in the USA over the past thirty years. Two primary schools of

[32] The €8.4 million average option grant in 2000 included a €540 million grant to Apple's Steve Jobs, who received 20 million stock options but no other compensation. In March 2003, Jobs voluntarily cancelled all his outstanding options (except for 60,000 granted to him as a director), and received 5 million shares of restricted stock with a grant-date value of €63 million. Dropping Jobs from the 2000 list would reduce the average option compensation to €7.3 million.

thought have emerged. The first is the "managerial power" view exemplified by Bebchuk, Fried and Walker (2002) and Bebchuk and Fried (2004a), in which powerful CEOs extract high levels of compensation from captive boards of directors. The second is the "efficient contracting" view in which the increase in pay reflects changes in the managerial labor market caused by changes in the distribution of company size (Gabaix and Landier (2008)) or the increased prevalence of hiring CEOs from outside the firm rather than promoting from within (Murphy and Zábojník (2007)). We will return to a discussion of the debate and a survey of the related literature below in Section 2.4. But, as evident from Figure 2.3, any compelling theory of trends in CEO compensation must address explicitly its most prominent features: the escalation in stock options from the mid-1980s through 2001, and the emerging dominance of restricted stock.

In the rest of this section, we will show how the trends in equity-based compensation can be traced in large part to USA tax policies, accounting rules, and politics, having little or nothing to do with either managerial power or changes in the managerial labor market.

2.4.1. The Rise (and Fall) of Restricted Stock Options (1950-1969)

While a modest number of companies issued stock options during the 1930s and 1940s, America's fascination with stock options began in earnest with the Revenue Act of 1950. Prior to the Act, the gains from exercising stock options were taxed as ordinary income to the individual, and deductible as compensation expense to the company. The 1950 Act created a new type of options called "restricted stock options" that would be taxed as capital gains (rather than ordinary income) not upon exercise but only when the shares acquired through exercises were ultimately sold. While these capital gains were not deductible by the firm as a compensation expense, the spread between the tax rate on ordinary income and capital gains was sufficient to make the new options highly tax advantageous. In particular, in addition to creating restricted stock options, the Revenue Act of 1950 increased the top marginal tax rate on ordinary income to 91% while increasing the top corporate tax rate to 50.75%.[33] Given these rates, it cost investors approximately €5.47 in after-tax profit to convey an incremental €1 in after-tax income to the CEO through cash salaries (or "non-qualified" stock options

[33] Under the Revenue Act of 1950, the top individual rate of 91% was triggered at income levels exceeding $200,000; the top marginal rate was 90% for income between $150,000 and $200,000 and 89% for income between $100,000 and $150,000. Fryman and Saks (2008) estimate that the median corporate CEO earned about $150,000 in 1950, putting the median CEO at or near the top bracket. The top corporate rate of 50.75% was effective for corporations with over $25,000 in taxable income.

upon exercise).[34] In contrast, at the 25% tax rate on capital gains, it cost investors only €1.33 to convey €1 in after-tax income taxable as long-term capital gains (even though such gains were not deductible by the firm as a compensation expense).

The passage of the 1950 Act launched a predictable wave of new option plans. In 1950 approximately 4% of the companies listed on the NYSE had option plans for their top executives; by June 1951 the number had tripled to 12%.[35] In their study of the fifty largest firms in 1940 and 1960, Frydman and Saks (2008) estimate that the fraction of executives holding stock options in the increased from less than 10% in 1950 to over 60% by 1960. Grant sizes also grew: the grant-date value of options for those executives receiving options increased from about 10% of total compensation in the early 1950s to over 20% of total compensation by the early 1960s.

During the 1960 recession, companies began "repricing" options by either resetting exercise prices or by canceling existing options and replacing them with new options with lower exercise prices. This practice became highly controversial in the early years of the Kennedy Administration, leading to a series of Congressional hearings aimed at repealing the favorable tax treatment for restricted stock options.[36] The controversy intensified in late 1963 and early 1964 when it was revealed that executives at Chrysler had realized $4.2 million in gains from exercising stock options in 1963, and had sold nearly 200,000 shares acquired through earlier exercises.[37] Ultimately, as part of the Revenue Act of 1964, Congress stopped short of removing the favorable tax status of restricted stock options, but took several steps that substantially reduced their attractiveness. In particular, under the new law:

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34 At a 91% tax rate, the CEO must receive €11.11 before tax to realize €1 after tax. But, at a 50.75% corporate tax rate, paying €11.11 in deductible compensation costs reduces after-tax profits by €5.47.

35 Mullaney, "Parley Here Indicates the Continued Spread in Industry of Stock Purchase Option Plans," *New York Times* (August 12, 1951), p. 109. The percentages are based on average of 840 NYSE-listed firms in 1950 and 876 in June 1951.

36 "Options on the Wane: Fewer Firms Plan Sale of Stock to Executives at Fixed Exercise Prices," *Wall Street Journal* (December 6, 1960), p. 1; "Congress and Taxes: Specialists Mull Ways to Close "Loopholes" in Present Tax Laws," *Wall Street Journal* (January 7, 1959), p. 1; "House Group Hears Conflicting Views on Stock Option Taxes," *Wall Street Journal* (December 8, 1959), p. 16.

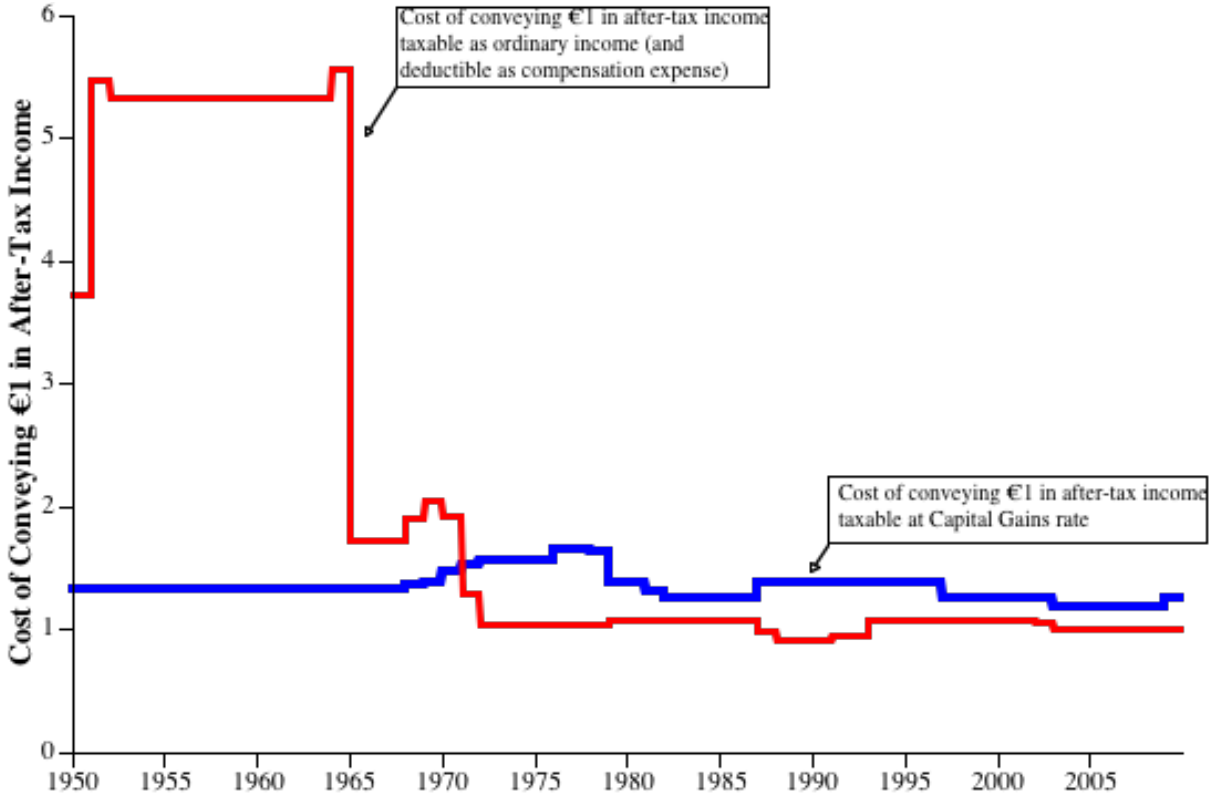
37 "Chrysler Chairman Defends Option Plan, Offers to Discuss It With Federal Officials," *Wall Street Journal* (December 23, 1963), p. 6; "Chrysler Officers Got Profit of $4.2 Million On Option Stock in '63," *Wall Street Journal* (January 15, 1964), p. 6; "Chrysler Officers' Sale of Option Stock Could Stir Tax Bill Debate," *Wall Street Journal* (December 18, 1963), p. 1; "House Unit Seen Favoring Curbs on Stock Options," *Wall Street Journal* (February 25, 1963), p. 3; "Senate Unit Votes to Tighten Rules on Stock Options," (January 15, 1964), p. 2.

- Executives were required to hold stock acquired through option exercises for three years (rather than six months under the 1950 Act) in order to be taxed at the lower capital gains rate.
- Exercise prices to be set at no less than 100% (rather than 85% under the 1950 Act) of the grant-date market prices.
- The maximum option term was reduced from ten years to five years.
- Repricing of options were prohibited.

To distinguish options meeting these new requirements from restricted options granted under the Revenue Act of 1950 provisions, the 1964 Act referred to new grants as "qualified stock options" rather than restricted stock options.

Finally (but perhaps most importantly), the 1964 law reduced the top marginal tax rate on ordinary income from 91% to 70%, which significantly reduced the attractiveness of qualified options over "non-qualified stock options" (in which the gains upon exercise are taxed as ordinary income for the recipient, and deductible as a compensation expense to the company cash compensation). Figure 2.7 provides a historical comparison of the tax advantages of restricted or qualified stock options relative to cash compensation or "non-qualified stock options." As a result of the 1964 tax law, the after-tax cost to investors of conveying an after-tax Euro to the CEO in cash compensation fell from €5.56 to €1.73, while the cost of conveying an after-tax dollar in restricted or qualified stock options (taxed as capital gains) remained at €1.33.

Figure 2.7 The USA Tax Acts of 1964 and 1969 reduced the tax advantages of restricted stock options



Note: The figure shows the after-tax cost to investors of conveying an incremental €1 in after-tax income under two tax regimes: (1) ordinary compensation (taxable to the recipient at the top marginal rate for earned income (t_I), and deductible by the firm at the top marginal rate for corporate income (t_C)), and (2) capital gains (taxable to the recipient at the capital gains rate (t_G), but not deductible by the firm). The cost for ordinary income is computed as $(1-t_I)/(1-t_C)$, while the cost for capital gains is $1/(1-t_G)$.

The popularity of qualified stock options fell as a result of the 1964 tax law[38] and collapsed following the Tax Reform Act of 1969, which gradually reduced the top marginal tax rate on earned income from 77% in 1969 to 50% by 1972, reduced the corporate tax rate from 52.8% to 48%, and raised the top capital gains tax rate from 25% in 1969 to 36.5%. In addition, the 1969 Act defined gains from exercising restricted or qualified options as a "tax preference" item subject to a new Alternative Minimum Tax (AMT) on high wage earners.[39] Once the new rates were fully implemented (and ignoring AMT issues), it cost investors approximately €1.04 in after-tax profit to convey an incremental €1 in after-tax income to

[38] See Stanton, "Cash Comeback: Stock Options Begin to Lose Favor in Wake of Tax Law Revision," *Wall Street Journal* (August 10, 1964), p. 1. Stock options briefly resurged in 1966, following at 25% increase in the Dow Jones average from 1964 to early 1966 (Elia, "Opting for Options: Stock Plans Continue in Widespread Favor Despite Tax Changes," *Wall Street Journal* (July 15, 1967), p. 1).

[39] In particular, if the option gains exceed 50% of the executive's total income (including option gains), the amount of the option gain over 50% would be treated as fully taxable ordinary income.

the CEO through cash compensation or non-qualified stock options, and €1.57 to convey €1 in qualified stock options. Thus, for executives and companies in the highest tax brackets, qualified stock options became tax disadvantageous compared to non-qualified stock options, and (as illustrated in Figure 2.7) have remained so throughout the early 2000s. Restricted or qualified stock options – which had been the dominant form of long-term incentives for two decades – virtually disappeared from existence.

Congress resurrected a new form of qualified options (now called "Incentive Stock Options" or ISOs) as a last-minute addition to the Economic Recovery Tax Act of 1981.[40] ISOs carried many of the restrictions common for qualified stock options (holding periods after exercise, minimum exercise prices, etc.), and in addition were limited to $100,000 per executive per year (calculated as the stock price multiplied by the number of options on the date of grant). While ISOs have continued to be popular in the 2000s for middle-level managers (where the $100,000 limitation is not binding) and for companies without taxable profits (where loss of deductibility for ISOs is not costly), virtually all options granted to CEOs and other top executives since 1972 have been non-qualified stock options.

2.4.2. There's No Accounting for Options (1972-2005)

The restricted and qualified stock options created by the 1950 and 1964 Revenue Acts were not formally considered "compensation" and therefore companies did not record an expense for such options for either tax or accounting purposes. The switch to non-qualified options in the 1970s – which were considered compensation for tax purposes – raised a new question: how should options be accounted for in company income statements? One possibility was to follow the tax code and recognizing an accounting expense at the time an option is exercised. But, in spite of its simplicity, this method is inconsistent with the basic tenet of accounting that expenses should be matched to the time period when the services associated with those expenses were rendered. Rather, the tenet suggested that options should be expensed over their term based on the grant-date value of the option. At the time, however (and for a long time to come) there was no accepted way of placing a value on an employee stock option.

In October 1972, the Accounting Principles Board (APB) – the predecessor to the current Financial Accounting Standards Board (FASB) – issued APB Opinion No. 25, "Accounting for Stock Issued to Employees." Under APB Opinion No. 25, the compensation

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[40] Bettner, "Incentive Stock Options Get Mixed Reviews, Despite the Tax Break They Offer Executives," *Wall Street Journal* (August 24, 1981), p. 32.

expense associated with stock option was defined as the (positive) difference between the stock price and the exercise price as of the first date when both the number of options granted and the exercise price become known or fixed. The expense for this spread between the price and exercise price – called the "intrinsic value" – was amortized over the period in which the employee is prohibited from exercising the option.[41] Under this rule, there was no charge for options granted with an exercise price equal to (or exceeding) the grant-date market price, because the spread is zero on the grant date.

The accounting treatment of options promulgated the mistaken belief often espoused in boardrooms that options could be granted without any cost to the company. The treatment also cemented the dominance of the "traditional stock option" (an option granted with a five or ten-year term with an exercise price equal to the grant-date market price) and prevented companies from offering more novel option plans. For example, APB Opinion 25 imposes a higher accounting charge for options with an exercise price indexed to the stock-price performance of the market or industry, because the exercise price is not immediately fixed. Similarly, it imposes a higher accounting charge for options that only become exercisable if certain performance triggers are achieved, because the number of options is not immediately fixed.

The 1972 opinion pre-dated the Black and Scholes (1973) equation, which offered the first formula for computing the value of a traded call option. Academic research in option valuation exploded over the next decade, and financial economists and accountants became increasing intrigued with using these new methodologies to value, and account for, options issued to corporate executives and employees.

In 1984, FASB floated the idea that companies account for employee stock options using the so-called "minimum value approach."[42] By June 1986, the FASB "idea" had evolved into a proposal with the important change that the accounting charge would be based on the fair market value (e.g., the Black-Scholes value) and not a minimum value. The proposal was vehemently opposed by all of the "Big Eight" accounting firms, the American Electronics Association (including more than 2,800 corporate members), the Financial

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41 This period is often called the "vesting period" but this terminology is misleading.

42 Under the "minimum value approach," the value of an option on a non-dividend-paying stock is calculated as the current stock price minus the grant-date present value of the exercise price. For example, the value of a ten-year option granted with an exercise price of €30 when the grant-date market price was €25 would be $V = €25 - €30/(1+r)^{10}$, where r is the risk-free rate.

Executives Institute, the Pharmaceutical Manufacturer' Association, and the National Venture Capital Association.[43]

Ultimately, and without fanfare, FASB tabled its 1986 proposal before submitting an exposure draft. However, the proposal was revived in the early 1990s as CEO pay once again became highly controversial. In late 1991, Senator Carl Levin attempted to bypass FASB by introducing legislation that would require companies to take a charge to their earnings to reflect the cost of option compensation packages; the bill also directed the SEC to require more disclosure for stock option arrangements in company proxy statements. Although Levin's bill was ultimately shelved, it provided pressure for renewed FASB focus on option expensing.

In April 1992, FASB voted 7-0 to endorse an accounting charge for options, and issued a formal proposal in 1993. The proposal created a storm of criticism among business executives, high-tech companies, accountants, compensation consultants, the Secretary of the Treasury, and shareholder groups.[44] Even President Clinton, usually a critic of high executive pay, waded into the debate in December, expressing that "it would be unfortunate if FASB's proposal inadvertently undermined the competitiveness of some of America's most promising high-tech companies."[45] In March 1994, FASB held public hearings on the issue. In the aftermath of the overwhelmingly negative response, FASB announced it was delaying the proposed accounting change by at least a year, and in December it dropped the proposal.

In 1995, the FASB issued a compromise rule, FAS123, which *recommended* but did not require that companies expense the "fair market value" of options granted (using Black-Scholes or a similar valuation methodology). However, while FASB allowed firms to continue reporting under APB Opinion No. 25, it imposed the additional requirement that the value of the option grant would be disclosed in a footnote to the financial statements.

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[43] See, for example, Rudnitsky and Green, "Options Are Free, Aren't They?," *Forbes*, (August 26, 1985); Gupta and Berton, "Start-up Firms Fear Change in Accounting," *Wall Street Journal* (June 23, 1986); Fisher, "Option Proposal Criticized," *New York Times* (December 27, 1986); Eckhouse, "Tech Firms' Study: Accounting Rule Attacked," *San Francisco Chronicle* (April 10, 1987)

[44] See, for example, Berton, "Business chiefs try to derail proposal on stock options," *Wall Street Journal* (February 5, 1992); Harlan and Berton, "Accounting Firms, Investors Criticize Proposal on Executives' Stock Options," " *Wall Street Journal* (February 19, 1992); "Bentsen Opposes FASB On Reporting Stock Options," *Wall Street Journal* (April 7, 1993); "Clinton Enters Debate Over How Companies Reckon Stock Options," *Wall Street Journal* (December 23, 1993); Berton, "Accounting Rule-Making Board's Proposal Draws Fire," *Wall Street Journal* (January 5, 1994); Harlan, "High Anxiety: Accounting Proposal Stirs Unusual Uproar In Executive Suites," *Wall Street Journal* (March 7, 1994).

[45] "Clinton Enters Debate Over How Companies Reckon Stock Options," *Wall Street Journal* (December 23, 1993).

Predictably, only a handful of companies adopted FASB's recommended approach. As we'll discuss below, it wasn't until the accounting scandals in the early 2000s that firms voluntarily began to expense their option grants.

2.4.3. The $1 Million Deductibility Cap and the Stock Option Explosion

Corporations in the USA are generally allowed to deduct from income all "reasonable" compensation expenses. In the 1992 USA presidential campaign, candidate Bill Clinton promised to "end the practice of allowing companies to take unlimited tax deductions for excessive executive pay" by defining compensation exceeding $1 million as unreasonable and therefore not deductible. Concerns about the loss of deductibility following the election contributed to an unprecedented rush to exercise options before the end of the 1992 calendar year, as companies urged their employees to exercise their options while the company could still deduct the gain from the exercise as a compensation expense.[46] In anticipation of the loss of deductibility, large investment banks accelerated their 1992 bonuses so that they would be paid in 1992 rather in 1993. In addition, several publicly traded Wall Street firms, including Merrill Lynch, Morgan Stanley, and Bear Stearns, announced that they were consider returning to a private partnership structure if President-elect Clinton's plan were implemented.[47]

By February 1993, President Clinton backtracked on the idea of making *all* compensation above $1 million unreasonable and therefore non-deductible, suggesting that only pay "unrelated to the productivity of the enterprise" was unreasonable.[48] In April, details of the considerably softened plan began to emerge.[49] As proposed by the Treasury Department and eventually approved by Congress as part of the Omnibus Budget Reconciliation Act of 1993, Section 162(m) of the tax code applies only to public firms and not to privately held firms, and applies only to compensation paid to the CEO and the four highest-paid executive officers as disclosed in annual proxy statements (compensation for all others in the firm is fully deductible, even if in excess of the million-dollar limit). More

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46 Chronicle Staff and Wire Reports, "Big Earners cashing in now: fearful of Clinton's tax plans, they rush to exercise their options," *San Francisco Chronicle* (December 29, 1992).

47 Siconolfi, "Wall Street is upset by Clinton's support on ending tax break for 'excessive' pay," *Wall Street Journal* (October 21, 1992).

48 Freudenheim, "Experts see tax curbs on executives' pay as more political than fiscal," *New York Times* (February 12, 1993).

49 Greenhouse, "Deduction proposal is softened," *New York Times* (April 9, 1993).

importantly, Section 162(m) does not apply to compensation considered "performance-based" for the CEO and the four highest paid people in the firm.

Stock options granted with an exercise price at or above the grant-date market price are generally considered performance-based compensation as defined under Section 162(m), and are therefore gains from exercising such options are fully deductible as a compensation expense. However, restricted stock, and options issued with an exercise price below the grant-date market price do not qualify as performance based.

The "safe harbor" for option grants under Section 162(m), coupled with the FASB's largely contemporaneous decision that options could be granted without an accounting expense to the company, opened the floodgate on option grants in the USA. As shown in Figure 2.3, CEO incentive compensation in the early 1990s was split about evenly between options and accounting-based bonuses. By 1996, options had become the largest single component of CEO compensation in S&P 500 firms, and the use of options was even greater in smaller firms (and especially high-tech start-ups). By 2000, stock options accounted for more than half of total compensation for a typical S&P 500 CEO.

As grants for top executives increased, companies faced growing pressure to push grants to managers and employees at lower levels in the organization[50]. Employees clamored for broad-based grants, but only if the company would promise that other components of their compensation would not be lowered. Boards readily succumbed, especially since (prior to changes in exchange listing requirements in mid-2003) shareholder approval was required for plans where option awards were concentrated among top executives but was *not* required for broad-based plans that covered large numbers of employees. In addition, several bills that encouraged broad-based stock option plans were introduced in Congress, including the "Employee Stock Option Bill of 1997" (H.R. 2788) to ease the restrictions on qualified Incentive Stock Options granted to rank-and-file workers. As a result of these pressures, the number of options granted (expressed as a fraction of outstanding shares) grew substantially.

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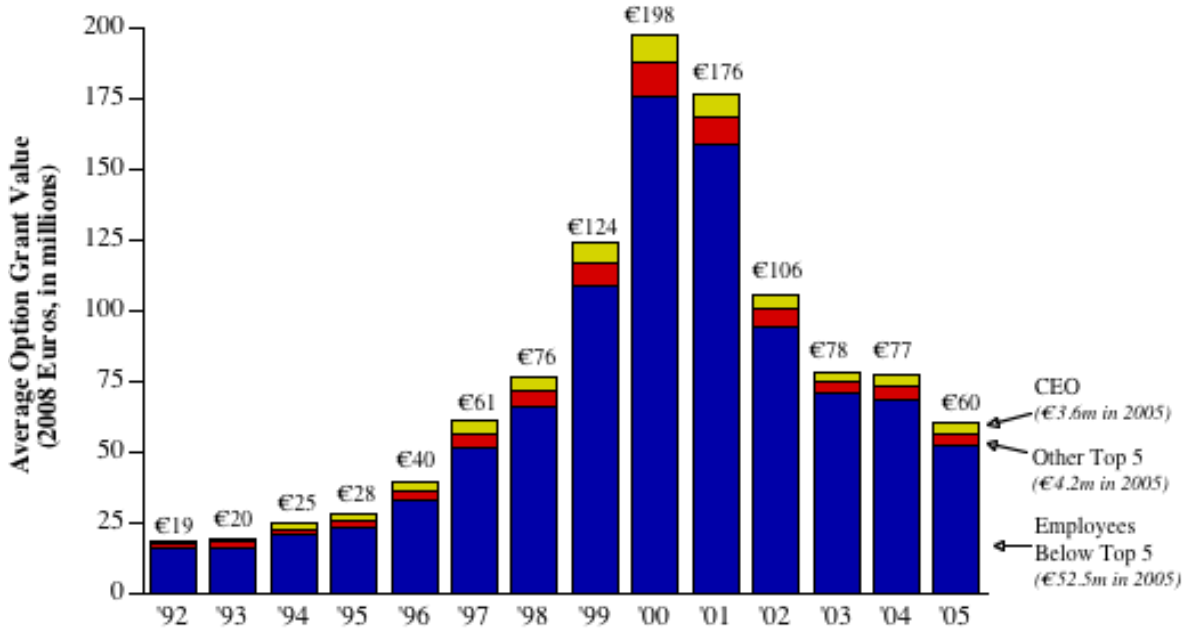
50 See, for example, Flanigan, "It's Time for All Employees to Get Stock Options," *Los Angeles Times* (April 21, 1996), who argued that all employees should receive options if top executives receive options.

Figure 2.8 Grant-Date Values of Employee Stock Options in the USA S&P 500, 1992-2006

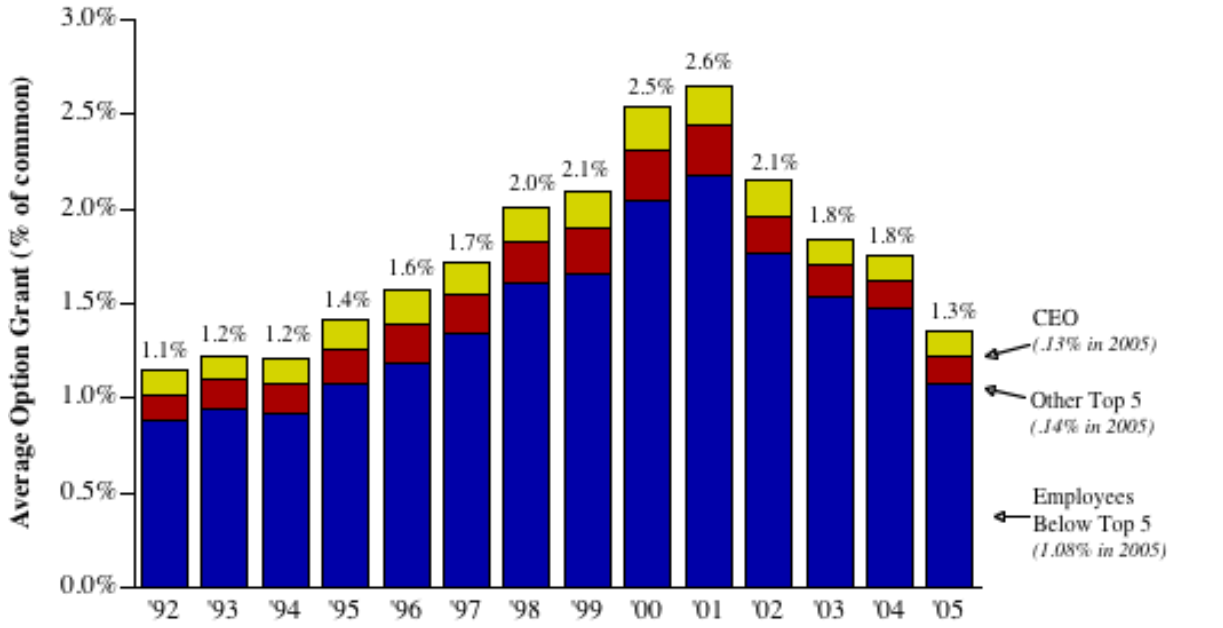


Note: Figure shows the grant-date value of options granted to all employees in an average S&P 500 firm, based on data from S&P's ExecuComp data. Grants below the Top 5 are estimated based on "Percent of Total Grant" disclosures; companies not granting options to any of their top five executives are excluded. Grant-values are based on company fair-market valuations, when available, and otherwise use ExecuComp's modified Black-Scholes approach. The number in parentheses indicates the value of the grant, on average, that is awarded to the indicated employee (or employee group). Monetary amounts are converted to 2008-constant US dollars, and then converted to Euros using the 2008 year-end exchange rate.

Figure 2.8 shows the average inflation-adjusted grant-date values of options awarded by the average firm in the S&P 500 from 1992-2005.[51] Over this decade, the value of options granted increased from an average of €19 million per company in 1992 to nearly €200 million per company in 2000, falling to €60 million per company in 2005. Ignored in the news coverage and controversy over stock options awarded to CEOs and the next four highest-paid executives is the fact that employees and executives ranked below the top five have received between 85% and 90% of the total option awards. Figure 2.9 shows average annual option grants as a fraction of total common shares outstanding. In 1992, the average S&P 500 company granted its employees options on about 1.1% of its outstanding shares. In 2001, in spite of the bull market that increased share prices (that, in turn, increased the value of each granted option), the average S&P 500 company granted options to its executives and

[51] Options granted to lower-level executives and employees are estimated by dividing the options granted to the proxy-named executives by the percentage of all options that are granted to the proxy-named executives. Under the new 2006 disclosure rules, the SEC no longer requires companies to report the percentage of all option awards that went to the proxy-named executives, and therefore our estimates of grants across the company end in 2005.

Figure 2.9 Grant-Date Number of Employee Stock Options (measured by % of company shares) in the USA S&P 500, 1992-2005



Note: Figure shows the grant-date value of options (in millions of 2006-constant dollars) granted to all employees in an average S&P 500 firm, based on data from S&P's ExecuComp data. Grants below the Top 5 are estimated based on "Percent of Total Grant" disclosures; companies not granting options to any of their top five executives are excluded. Grant-values are based on company fair-market valuations, when available, and otherwise use ExecuComp's modified Black-Scholes approach. The number in parentheses indicates the value of the grant, on average, that is awarded to the indicated employee (or employee group).

employees on 2.6% of its shares. By 2005, annual grants as a fraction of outstanding shares fell below 1995 levels to 1.3%.

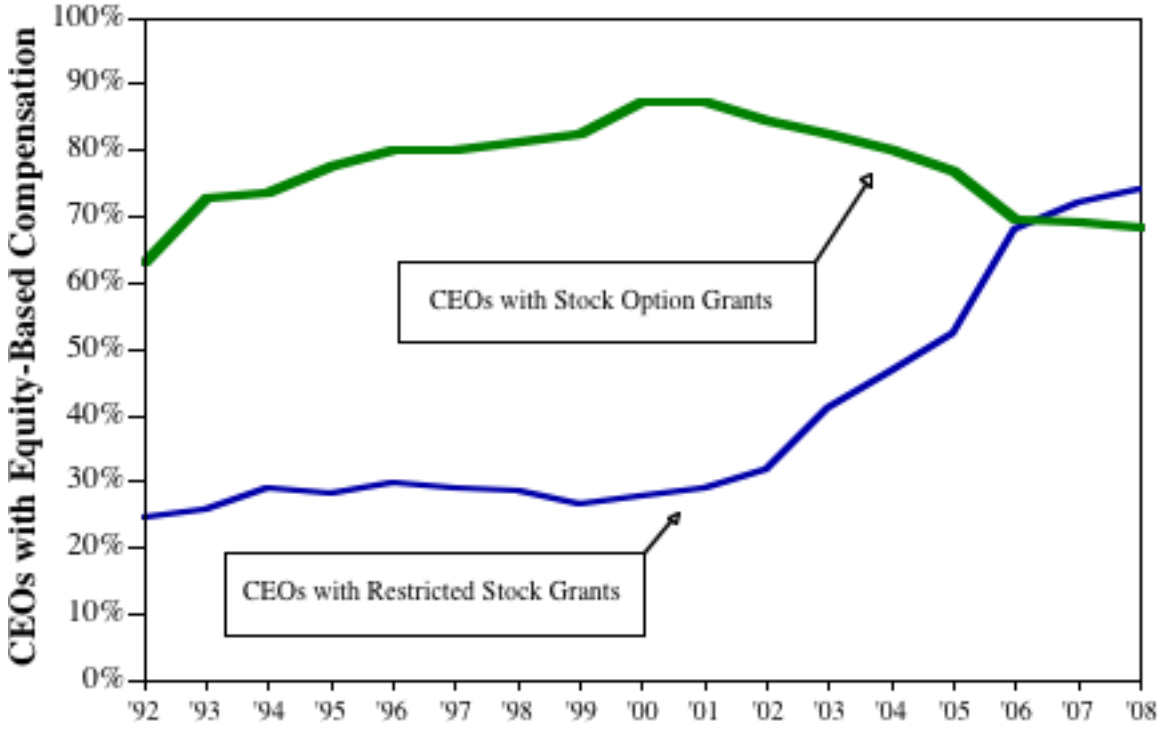
Over the 14-year 1992-2005 time period, the average USA S&P 500 company awarded over €1 billion worth of options to its executives and employees (or €500 billion across all 500 companies). Moreover, the average S&P 500 company transferred through options approximately 25.6% of its total outstanding equity to its executives and employees.[52]

2.4.4. Options Replaced By Restricted Stock (2002-2010)

As shown in Figure 2.2, the compensation of the median S&P 500 CEO peaked in 2001 after increasing monotonically for over a decade; average compensation peaked a year earlier along with the Internet "bubble." Since that time, both median and average compensation have fluctuated, but have not displayed a discernable trend. But, as shown in Figure 2.3, the

[52] The 25.6% calculation simply sums the annual percentages in Figure 2.9. This calculation overstates the transfer of equity to the extent that some options are forfeited or expire worthless, and understates the transfer of equity to the extent that the overall base of shares expands as options are exercised or as the company offers additional shares.

Figure 2.10 CEOs in USA S&P 500 Firms receiving equity-based compensation, 1992-2008



Note: Sample is based on all CEOs included in the S&P 500, based on Standard and Poors' ExecuComp database.

apparent "leveling" of CEO pay in the USA masks a more dramatic change: the decline in stock options and the emergence of restricted stock as the largest single component of compensation. Figure 2.10 shows the percentage of S&P 500 companies that made stock option or restricted stock grants to their CEOs between 1992 and 2008. The percentage of companies granting options in each year increased from about 63% in 1992 to 88% by 2000, falling to 68 percent in 2008. Over the same time period, the percentage of companies making restricted stock grants more than tripled from 24 percent to 74 percent. We believe that a large part of these trends reflects the changes in the accounting treatment of stock options.

Accounting scandals erupted across corporate America during the early 2000s, destroying the reputations of once-proud firms such as Enron, WorldCom, Qwest, Global Crossing, HealthSouth, Cendant, Rite-Aid, Lucent, Xerox, Fannie Mae, Freddie Mac and Arthur Anderson. The scandals focused attention on the quality of accounting disclosures, which in turn renewed pressures for companies to report the expense associated with stock options on their accounting statements. Before 2002, only a handful of companies had elected to "expense options" under FAS123; the remainder elected to account for options under the old rules (where there was typically no expense). In the summer of 2002, several

dozen firms announced their intention to expense options voluntarily; more than 150 firms had elected to expense options by early 2003 (Aboody, Barth and Kasznik (2004)). Moreover, shareholder groups (most often representing union pension funds) began demanding shareholder votes on whether options should be expensed; more than 150 shareholder proposals on option expensing were submitted during the 2003 and 2004 proxy season (Ferri and Sandino (2009)). By late 2004, about 750 companies had voluntarily adopted or announced their intention to expense options.

In December 2004, FASB announced FAS123R which revised FAS123 by *requiring* all USA firms to recognize an accounting expense when granting stock options, effective for fiscal years beginning after June 15, 2005. The expense would be based on the fair market value at time of grant, calculated using Black and Scholes (1973) or a similar methodology, amortized over the period when the option is non-exercisable. Using "fair market-value accounting" brought USA standards in line with the international standards issued in February 2004 by the International Accounting Standards Board (IASB). The rule also "leveled the playing field" between stock options and restricted stock, which had been expensed at their grant-date fair market value (amortized over their vesting period) since APB Opinion No. 25 in 1972. As a result, companies reduced the number of options granted to top executives (and other employees), and greatly expanded the use of restricted shares.

Financial economists generally dismiss the idea that executives would react to accounting changes that have no effect on current or future cash flows. But, as we discuss in Section 2.5 below (see also Murphy (2002); Hall and Murphy (2003)), there is ample evidence that options were granted in such great quantities, and to so many employees, precisely because executives and boards of directors viewed options as essentially "free" (or at least cheap) to grant. Advocates of broad-based option programs in Congress, fearing that fair market-value accounting for options would end of option grants to low-level employees, introduced several (ultimately shelved) bills to protect such programs, including:

- The "Workplace Employee Stock Option Act of 2002." (H.R. 5242), which provided incentives for broad-based option programs by allowing employees to purchase options and stock through pre-tax payroll deductions, and providing accelerated tax deductions for employers.
- The "Rank-and-File Stock Option Act of 2002" (S. 2877), which limited the tax deduction companies could take if a stock-option program was not broad based.

These bills, and several others, were shelved in committee. Ultimately, and predictably, the expensing of options indeed curtailed the practice of broad-based option plans: firms that already had such plans granted fewer options, and virtually no firms without plans introduced one. As evident from Figure 2.9, the average number of options granted by firms to all employees fell by half from 2001 to 2005 (from 2.6% of outstanding shares each year in 2001 to 1.3% in 2005).

While accounting issues can explain the reduction in option grants and increased emphasis on restricted stock, the 2000 burst in the Internet bubble (followed by the terrorist attack in September 2001) also certainly also played a role. In particular, the sharp market-wide decline in stock prices in the early 2000s left many outstanding options underwater and lowered executive expectations for the future increases in their company's stock prices. Indeed, in many cases, including Microsoft and Cablevision, current outstanding (but out-of-the-money) options were cancelled and replaced with restricted stock, often at terms very favorable to executives. Executives will naturally prefer restricted stock to options when they have low expectations for future firm performance. While restricted stock will always retain some value as long as the firm is valued at greater than its liabilities, executives often expect that options granted in a declining market are likely to expire worthless.

Indeed, in addition to tax and accounting considerations, stock options have always become more popular when stock markets are trending upward (i.e., "bull markets") and less popular when markets trend down (i.e., "bear markets"). Indeed, almost every recession over the past 60 years has been associated with a reduced use of stock options, and during the "lackluster" 1970s many firms replaced their option plans with a plethora of new accounting-based plans designed to provide more predictable payouts, including: book-value plans (where executives receive dividends plus the appreciation in book values); long-term performance plans (with payouts based on long-term earnings growth targets); and guaranteed bonuses (with payouts guaranteed independent of performance).[53] Therefore, stock options would have predictably fallen in the market collapse in the early 2000s, but would also have predictably increased as markets improved. However, firms relied *less* and not *more* on options during the market run-up from March 2003 through October 2007, which is consistent with the accounting hypothesis.

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[53] Ricklefs, "Sweetening the Pot: Stock Options Allure Fades, So Firms Seek Different Incentives," *Wall Street Journal* (May 27, 1975), p. 1; Hyatt, "No Strings: Firms Lure Executives By Promising Bonuses Not Linked To Profits," *Wall Street Journal* (December 24, 1975), p. 1; Ricklefs, "Firms Offer Packages of Long-Term Incentives as Stock Options Go Sour for Some Executives," *Wall Street Journal* (May 9, 1977), p. 40.

2.5. Why Did CEO Pay Increase so Much in the USA?

The unparalleled rise in USA CEO pay from the mid-1980s through 2001 – propelled primarily by increases in the grant-date value of option awards – has generated a great deal of academic attention. One explanation offered for the increase in stock options is the increased focus on equity-based compensation advocated in the early 1990s by shareholder groups and academics such as Jensen and Murphy (1990a), who famously (or infamously) argued "It's not *how much* you pay, but *how* that matters." Jensen and Murphy (1990b) showed that CEOs of large companies were paid like bureaucrats in the sense that they were primarily paid for increasing the size of their organizations, received small rewards for superior performance, even smaller penalties for failures, and that the bonus components of the pay packages showed very little variability, less even then the variability of the pay of rank-and-file employees. They concluded that compensation committees and boards should focus primarily on the incentives provided by the pay package rather than the level of pay, and were joined by shareholder activists such as the United Shareholders Association in advocating more stock ownership and more extensive use of stock options.

As discussed above in Section 0, CEOs demand a "risk premium" for accepting stock options in lieu of safer forms of compensation, and this risk premium will increase when the CEO is less diversified (i.e., holding more shares of stock, either voluntarily or pursuant to stock-ownership guidelines). Therefore, any increase in stock options will naturally be associated with an increase in total compensation. However, as we showed in FIGURE TO COME, CEO pay has increased substantially even after adjusting for both inflation and risk (at least given the assumptions in FIGURE). Indeed, the increase in real median pay depicted in Figure 2.3 has occurred without any decrease in base salaries, bonuses, or "other" forms of compensation not tied to stock-price performance, and the increase in stock options seem primarily layered over what was already presumably competitive levels of compensation.

The academic literature focused on explaining the increase in CEO pay (beyond that accounted for by risk premia) is roughly divided into two camps: the "managerial power" camp and the "efficient contracting" camp. In this section, we will summarize both camps, referring readers to Frydman and Jenter (2010) for a more detailed analysis and literature review. We then summarize an alternative hypothesis motivated by our previous discussion and based on the "perceived cost" of granting stock options.

Before assessing how well the various theories explain the recent trends in CEO pay, it is useful to summarize what those trends are (that is, what the theories need to explain):

- Median expected pay for CEOs in the USA S&P 500 increased an average of 4.3% annual (after inflation) from 1983-1991, and by an average of 15.7% annually between 1991 and 2001.
- Most of the increase in pay reflects increases in the value of stock options granted.[54]
- Median CEO pay has fallen an average of 1.7% per year from 2001 to 2008. Over the same time period, firms have reduced their reliance on stock options and greatly increased their use of restricted stock.

Therefore, as noted in the introduction to Section 2.4, any compelling theory of trends in CEO compensation must not only explain the increase in pay levels but must also address explicitly its most prominent feature: the escalation in stock options from the mid-1980s through 2001. Better still, the theory should be consistent with the leveling of pay after 2001 and the emerging dominance of restricted stock.

2.5.1. Managerial Power

The "managerial power" camp begins with the self-interested executives envisioned by Berle and Means (1932) and Jensen and Meckling (1976) and adds a new element: the ability of these executives to influence both the level and composition of their own compensation packages, often (if not invariably) at the expense of shareholders. One of the leaders of this view is David Yermack, who has argued that CEOs extract rents from shareholders by timing their option grants to occur just before the release of good news (Yermack (1997)), by insider trading through their family charitable foundations (Yermack (2009)), through lucrative severance and change in control provisions (Hartzell, Ofek and Yermack (2004); Yermack (2006b); Dahiya and Yermack (2008)), and by consuming excessive perquisites (Yermack (2006a)).

The researchers most closely associated with the managerial-power camp are Lucian Bebchuk and Jesse Fried, who have argued in a series of papers that both the level and composition of pay are determined not by competitive market forces but rather by captive board members catering to rent-seeking entrenched CEOs.[55] In addition, the authors argue

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[54] The importance of stock options from 1992 - 2001 is evident from Figure 2.3. For the earlier period, Hall and Liebman (1998) show that the average inflation-adjusted value of stock option grants increased 721% between 1980 and 1994, while cash compensation increased only by 95%.

[55] See, for example, Bebchuk and Fried (2004a); Bebchuk and Fried (2004b); Bebchuk, et al. (2010); Bebchuk and Fried (2003); Bebchuk, et al. (2002); Fried (2008a); Fried (2008b); Fried (1998).

that the CEO's ability to extract rent is limited by outside scrutiny and criticism (the "outrage constraint"), and CEOs respond by extracting rents through difficult-to-observe or assess forms of compensation rather than through increased base salaries. They use their model to explain several common features of executive compensation plans, including the use (and misuse) of compensation consultants, the prevalence of stealth compensation (pensions, deferred pay, perquisites, and loans), gratuitous separation payments, and stock options that are uniformly granted at the money and not indexed for the market or industry.

Can managerial power explain the trends in CEO pay? We have no doubt that executives (like the rest of us) are self-interested and would prefer higher compensation to lower compensation. We also have little doubt that – while CEOs are never explicitly involved in setting their own pay – CEOs have subtle ways of influencing the compensation committee and the pay-setting process.[56] However, as noted by Frydman and Jenter (2010), there is no evidence that boards have become weaker or more captive over time. Indeed, most measures of board independence have improved since the mid-1980s, and NYSE and NASDAQ listing rule now require compensation committees to be composed solely of independent outside directors.

Can managerial power explain the growth in the use of stock options? Bebchuk, Fried and Walker (2002) suggest that firms can "camouflage" excessive pay by substituting stock options for cash compensation, under the theory that such grants are difficult to value and are easy to hide in annual disclosures. Under disclosure rules effective before 1992, information on option grants was indeed difficult to obtain.[57] However, the centerpiece of the sweeping new disclosure rules introduced in October 1992 focused on option grants, and two new tables were added to the proxy statements to describe the details of both the grant and the number and value of options held at the end of the year. Bebchuk, Fried and Walker (2002)

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[56] For example, Murphy (1999) observes that while "outside board members approach their jobs with diligence, intelligence, and integrity . . . judgment calls tend systematically to favor the CEO. Faced with a range of market data on competitive pay levels, committees tend to error on the high side. Faced with a choice between a sensible compensation plan and a slightly inferior plan favored by the CEO, the committee will defer to management. Similarly, faced with a discretionary choice on bonus-pool funding, the committee will tend to over- rather than under-fund."

[57] In September 1983, the SEC had reduced the amount of information companies needed to disclose on executive stock options. From 1978 to 1983, the "summary compensation table" in the proxy statement included not only cash compensation but also the number of new options granted and the increase in the intrinsic value of options held. Under the 1983 "paperwork reduction" rules, the summary compensation table included only cash compensation, the number of options granted was moved to later in the proxy, and information on outstanding options (and changes in the value of outstanding options) was eliminated. For details on the new rules, see Hudson, "SEC Rules Allow Concerns to Curb Pay Disclosure: Companies Likely to Divulge Less on Executive Fees, Incentives, and Stock Options," *Wall Street Journal* (September 23, 1983), p. 4.

would predict that options grants would fall as the amount of information increased. As evident from Figure 2.3, option grants escalated (rather than fell) following the new rules.

2.5.2. Efficient Contracting

The "efficient contracting" camp maintains that the observed level and composition of compensation reflects a competitive equilibrium in the market for managerial talent, and that incentives are structured to optimize firm value. The survey article by Edmans and Gabaix (2009) considers optimal contracting explanations for the pay practices criticized under the managerial power camp, and the survey article by Frydman and Jenter (2010) discuss how these theories can predict increases in CEO pay over time. We will discuss two of these theories below, and refer readers to the aforementioned surveys for more a more-detailed review of the literature.

Murphy and Zábojník (2007) attribute the increase in executive pay to the increased prevalence of hiring CEOs from outside the firm. During the 1970s, under 15% of newly appointed CEOs were hired externally. By, the late 1990s, nearly a third of all CEO appointments came from outside of the firm. In addition, conditional on hiring from the outside, firms in the USA have become much more likely to hire a CEO who has prior experience as the top executive at another firm. During the 1970s, less than 20% of the outside hires had previous CEO experience. By the 1990s, half of the outside hires had such experience. Murphy and Zábojník (2007) attribute the trend toward outside hiring as reflecting gradual changes in the nature of the CEO job, which they model as a shift in the relative importance of general "managerial capital" (human capital specific to CEO positions) over firm-specific capital (reflecting skills, knowledge, contacts, and experience valuable only within the organization).[58] They build a market equilibrium model in which a shift in the relative importance of general vs. firm-specific managerial capital leads to fewer promotions, more external hires, and an increase in equilibrium average wages for CEOs relative to the wages of lower-level workers.

We consider it plausible that the increased prevalence of outside hiring will increase average wages; if nothing else, employers must always pay a premium when hiring from outside compared to promoting from within. We do not, however, consider it plausible that the doubling of outside hiring could lead to a ten-fold increase in real CEO pay from 1970 to 2008. Moreover, we note that the CEOs in Murphy and Zábojník (2007) contribute only

[58] Frydman (2010) offers empirical evidence consistent with such a shift based on career-path information for CEOs from 1936 through 2003.

ability and not effort; there is no role for incentives and thus no obvious reason why the increase in pay would come in the form of stock options.

Gabaix and Landier (2008) build an equilibrium model in which the marginal product of managerial ability increases with firm size (so that it is optimal to assign the most talented managers to the largest firms). As shown by Rosen (1981) and Rosen (1982), such assortative matching produces equilibrium wages that are convex in ability, such that small increases in ability can lead to large increases in wages (since the CEO is assigned to a larger firm). Gabaix and Landier (2008)'s key insight is that the wage of a CEO will depend not only on firm size, but also on the size distribution of all firms in the relevant market: as the average firm becomes larger, managerial marginal products increase and competition for scarce managerial talent will bid up compensation. In particular, they show that a shift in the size distribution of firms will lead to a proportional shift in compensation, and conclude that "the six-fold increase in CEO pay between 1980 and 2003 can be fully attributed to the six-fold increase in market capitalization of large USA companies."

Like Murphy and Zábojník (2007), Gabaix and Landier (2008) focus solely on the level of compensation, and make no prediction about the composition of pay and therefore cannot explain why the increase in pay has been primarily driven by stock options. Moreover, while their insights on the size distribution are potentially important, their focus on market capitalization as the size measure is problematic since it conflates size, stock-price performance, and the vagaries of the market. Few would argue, for example, that Apple was really the third largest firm in the USA economy in April 2010 (and yet their market value after the release of the iPad was below only Exxon-Mobil and Microsoft). Similarly, Volkswagen was not the second-largest firm on the planet for a couple of days in late October 2008 after its stock price increased 350% over a two-day period (before tumbling by 60% over the following week).[59] While average CEO pay may have moved roughly proportionately with average market capitalization between 1980-2003, it far outpaced the growth in more traditional measures of size. For example, average revenues for the 500 largest firms ranked by revenue grew only by 50% after inflation from 1980-2003, while average employment for the 500 largest employers grew only by 19%.[60]

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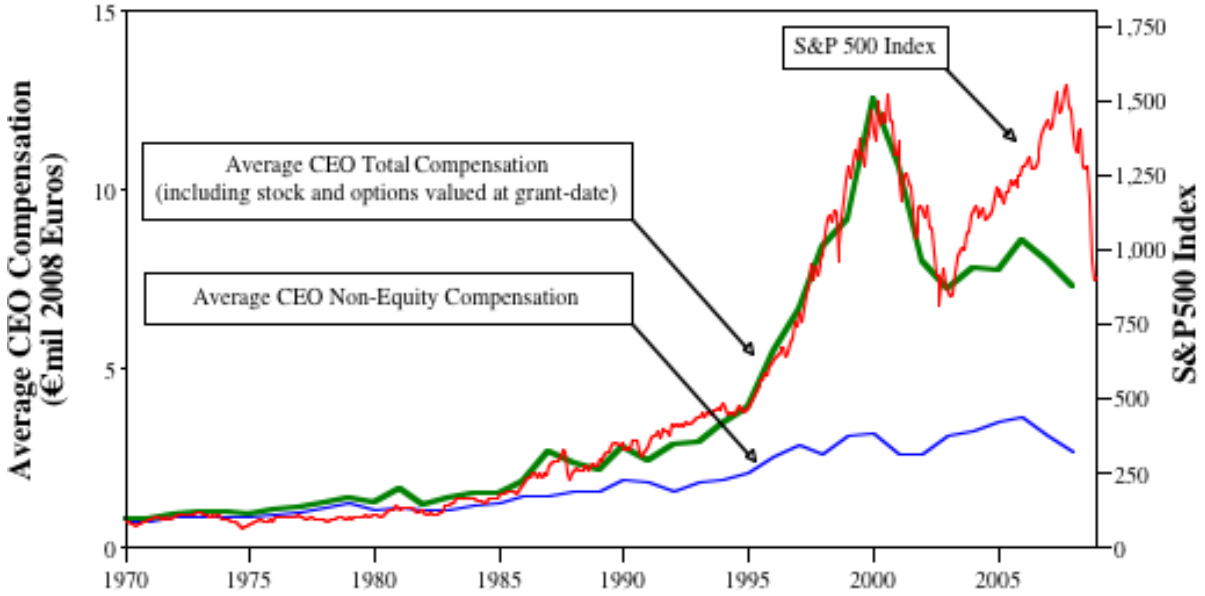
[59] Zuckerman, et al., "VW's 348% Two-Day Gain Is Pain For Hedge Funds," *Wall Street Journal* (October 29, 2008), p. C1.

[60] The Top 500 are for all USA-based firms in Compustat. Using the same methodology, we find that the average market value (including debt and equity) for the 500 largest USA firms grew by 300% between 1980 and 2003, substantially less than the 500% alleged by Gabaix and Landier (2008). We are unable to reconcile the difference.

Figure 2.11 Pay for CEOs in S&P 500 Firms vs. S&P 500 Index, 1970-2008



Note: The S&P 500 Index is a capitalization-weighted index of the prices of 500 large-cap common stocks traded in the USA; the figure depicts monthly values. Compensation data are based on all CEOs included in the S&P 500, using data from Forbes and ExecuComp. CEO total pay includes cash pay, restricted stock, payouts from long-term pay programs and the value of stock options granted (using company fair-market valuations, when available, and otherwise using ExecuComp's modified Black-Scholes approach). Equity compensation prior to 1978 estimated as 11.2% of total pay (based on Murphy (1985), equity compensation from 1979 through 1991 estimated as amounts realized from exercising stock options during the year, rather than grant-date values. Non-equity incentive pay is based on actual payouts rather than targets, since target payouts were not available prior to 2006. Monetary amounts are converted to 2008-constant US dollars using the Consumer Price Index, and then converted to Euros using the 2008 year-end exchange rate.

Although market capitalization is a particularly problematic measure of firm size, there is no denying the relation between average expected CEO pay and the overall performance of the stock market predicted by Gabaix and Landier (2008) and documented by Hall and Murphy (2003). Figure 2.11 depicts the correlation between the S&P 500 Index and average CEO pay between 1970 and 2008. The average total pay line is the same as in Figure 2.2, but instead of "average vs. median pay" Figure 2.11 shows average total compensation vs. average "non-equity" compensation (defined as all compensation except for stock options and restricted stock). As shown in the figure, while "non-equity compensation" is at most weakly related to the performance of the overall stock market, total compensation was almost perfectly correlated until 2003, when the "bull market" from 2003-2007 was associated with relatively modest increases in average CEO pay.

We would expect realized compensation to vary with the overall market, since the gains from exercising non-indexed stock options will naturally increase with the market. But, the compensation data in Figure 2.11 are based on the grant-date *expected* value of the options, and not the realized value from exercising options. The pattern depicted in Figure 2.11 is,

however, consistent with expected values if the company grants the same number of options each year (as opposed to the same "value" of options each year). Because the grant-date Black-Scholes cost of an option is approximately proportional to the level of the stock price, awarding the same number of options after a doubling of stock prices amounts to doubling the cost of the option award. Therefore, if the number of options granted stayed constant over time, the cost of the annual option grants would have risen and fallen in proportion to the changes in stock prices. But, as shown in Figure 2.9, boards did not award a constant number of options to employees and executives, but instead increased option grants as stock prices rose and decreased option grants as stock prices fell – further amplifying the relationship between the opportunity cost of option grants to changes in the level of stock prices.

While the evidence in Figure 2.11 is generally supportive Gabaix and Landier (2008)'s hypothesis, at least two puzzles remain. First, the relation between CEO compensation and market performance ended abruptly in 2002-03, which also coincides with the shift away from options towards restricted stock. Second, as documented in Figure 2.9, the escalation in option-based compensation was not limited to CEOs but in fact extended down the corporate hierarchy. The efficient-contracting explanation for increased equity pay is most relevant to CEOs and other top-level executives who can take direct actions to affect share prices, but not for lower-level employees. In addition, while the $1 million cap on deductibility may have helped trigger larger option grants for top executives, this rule only applied to the top five executives in each firm and therefore cannot explain the growth in options throughout the hierarchy.

2.5.3. Perceived Cost

Our discussion of the evolution of option grants in Section 2.4 suggests an alternative explanation for the growth of option-granting in the 1990s (which "explains" the growth in pay): decisions over options are made based on the "perceived cost" of options rather than on their economic cost (Murphy (2002), Murphy (2003), Hall and Murphy (2003)). When a company grants an option to an employee, it bears an economic cost equal to what an outside investor would pay for the option. But, prior to the recent changes in USA accounting rules, it bears no accounting charge and incurs no outlay of cash. Moreover, when the option is exercised, the company (usually) issues a new share to the executive, and receives a tax deduction for the spread between the stock price and the exercise price. These factors make the "perceived cost" of an option much lower than the economic cost.

From the perspective of many boards and top executives who perceive options to be nearly costless – or indeed deny that options have value when granted – the only way they can quantify the options they award is by the number of options granted. The focus on the quantity rather than the cost of options is further solidified by the institutions that monitor option plans. For example, under the current listing requirements of the New York Stock Exchange and Nasdaq, companies must obtain shareholder approval for the total number of options available to be granted, but not for the cost of options to be granted.[61] Advisory firms (such as Institutional Shareholder Services) often base their shareholder voting recommendations primarily on the option "overhang" (that is, the number of options granted plus options remaining to be granted as a percent of total shares outstanding), and not on the opportunity cost of the proposed plan. In addition, SEC disclosure rules in place between 1992 and 2006 required companies to report only the number of, rather than the value of, options granted in the "Summary Compensation Table", the primary or most visible compensation table in the company's annual proxy statement.[62] Therefore, boards and top executives often implicitly admitted that the *number* of options granted imposes a cost on the company, while at the same time denying that these options have any real dollar cost to the company.

In addition, boards and top executives understand that options, when exercised, dilute the shareholdings of current equity holders. The number of options granted is included in fully diluted shares outstanding and therefore increased grants will decrease fully diluted earnings per share. Thus the negative consequences associated with these reductions in earnings per share also vary with the number of options granted, and not with the dollar-cost of the grants, and are consistent with the observed excessive focus on the number of options awarded and outstanding and not their dollar cost to the firm.

The perceived-cost view of stock options explains why options were granted in such large quantities to large numbers of executives and employees and also explains why the grant-date opportunity cost of options rose dramatically and subsequently declined with the stock market as shown in Figure 2.11. If boards focused only on the number of options granted, and the number of options granted stayed constant or varied positively with stock

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61 Interestingly, as noted below, before 2003 companies did not need shareholder approval for options that would be issued broadly to executives and employees throughout the organization, but only for option grants that would be concentrated among the highest-level executives.

62 In addition, the SEC allowed companies to choose to report in the "Option Grant Table" either the fair market value of options granted or the potential realizable value of options assuming a stock price appreciation of 5% and 10% through the expiration dates of the options.

market performance (Figure 2.9), then the cost of the annual option grants would rise and fall in proportion to the changes in stock prices.

The perceived-cost view also explains why the relation between executive pay and the S&P 500 Index shown in Figure 2.11 weakened beginning in 2003 (thus also weakening the link between pay and market capitalization predicted by Gabaix and Landier (2008)). As discussed in Section 2.4.4, while FAS123R required firms to expense their options beginning in 2006, many firms began voluntarily expensing in early 2003. Expensing options brings the perceived cost of options more in line with their opportunity cost, and companies responded to the robust stock market from 2003-2007 by decreasing the number of options granted as stock prices increased (rather than increasing the quantity of options as happened from 1993-2001). Moreover, expensing brings the accounting treatment of options in line with the accounting treatment of restricted stock, explaining the shift from options towards restricted stock.

Finally, the perceived-cost view explains many prevalent features of stock options offered by the managerial-power camp as evidence for their position. For example, Bebchuk, Fried and Walker (2002) suggest that firms use uniform option terms (e.g., granting options "at the money") because diverging from normal practice by granting in-the-money options would spark outrage. Under the perceived-cost view, companies grant at-the-money options to avoid the accounting expense associated with in-the-money options. Indeed, the unsavory practice of "backdating" (in which firms granted in-the-money options but retroactively set the exercise date so the options appeared to be granted at the money) allowed firms to convey a given level of compensation without an accounting charge using fewer options than would be required without backdating. While the apparently common practice subsequently became "criminalized," many of the participants at the time viewed the practice as a minor accounting transgression that saved the shareholders a little dilution.[63]

The perceived-cost view is readily acknowledged by practitioners and compensation consultants, but is usually denied or dismissed by financial economists because it implies systematic suboptimal decision-making by managers and a fixation on accounting numbers that defies economic logic. But executives often respond to accounting concerns in ways that seem irrational to economists. As an example, the disappearance of option repricing

[63] Many companies charged with backdating have restated their earnings to account for the spread between the market and exercise price on the actual grant date, which suggests that the alternative to backdating was to grant in-the-money options and take an accounting charge. But, under the perceived-cost view, the alternative to backdating was granting a larger number of options at the money to avoid the accounting expense.

illustrates how companies respond to accounting rules that have no affect on company cash flows. This common, but controversial, practice virtually disappeared after December 1998, when FASB imposed an accounting charge for repriced options (see Murphy (2003), Carter and Lynch (2003)). Many companies with declining stock prices circumvented the accounting charge on repriced options by canceling existing options and re-issuing an equal number of options after waiting six months or more. But this replacement is not neutral. It imposes substantial risk on risk-averse employees since the exercise price is not known for six months and can conceivably be *above* the original exercise price. In addition, canceling and reissuing stock options in this way provides perverse incentives to keep the stock-price down for six months so that the new options will have a low exercise price. All of this scrambling to avoid an accounting charge!

While expensing stock options mitigates perceived-cost inefficiencies, the prior accounting treatment had permanent consequences for the level of CEO pay in the USA. In particular, suppose that boards believed the cost of granting options was small, and as a result granted too many options during the bull market in the 1990s. Although the boards believed that granting the options imposed little cost on the company, they were valued by executives (albeit not as high as they would value cash or stock, for the reasons discussed in Section 0) and became an important part of the competitive pay package for CEOs and other top executives. When the options became "expensive" due to the new accounting treatment, boards could not reduce or eliminate the options without compensating the executives for the lost opportunities. Pay levels largely stopped increasing as companies shifted away from options toward restricted stock Figure 2.3, but did not fall by much; indeed, many companies exchanged options for an equivalent Black-Scholes value of restricted stock. The end result was a permanent upward shift in pay levels for CEOs and other senior executives.

Ultimately, the managerial-power, efficient-contracting, and perceived-cost explanations for the increase in CEO pay are not mutually exclusive, and elements from all three explanations have plausibly contributed to the trend, as did tax and disclosure rules and social policy promoting widespread employee ownership. In fact, part of the increase in options during the 1990s plausibly reflects the fact that they seemed to be working: corporate boards and top managers began to associate option grants with successful company performance, especially during the high-tech and Internet boom of the late 1990s. Indeed, the increase in options coupled with the renewed focus on shareholder value creation may help explain the overall growth in stock market during this period.

Appendix: Stock Options and the Black-Scholes Formula

Stock options are contracts that give the recipient the right to buy a share of stock at a pre-specified "exercise" price for a pre-specified term. "European options" must be exercised only on a specific day in the future, while "American options" may be exercised anytime between the grant and the option's expiration. While these geographic designations may have been mildly relevant historically for describing put and call options traded on organized exchanges, there is no systematic difference in the exercisability of executive stock options in the USA and Europe.

Executive options usually last for ten years, and typically become "vested" (i.e., exercisable) over time: for example, 25% might become exercisable in each of the four years following grant. (Therefore, executive options are a hybrid combination of European and American options.) Executive options are non-tradable, and are typically forfeited if the executive leaves the firm before vesting (although "accelerated vesting" is a commonly negotiated severance arrangement, especially following a change in control).

The Black-Scholes (1973) option value formula is the most common method of valuing executive stock options. Although explicitly appropriate only for European options (or American options on non-dividend-paying stocks) held by diversified investors who can hold short positions in a company's stock, the Black-Scholes formula has been endorsed by the SEC and FASB as the preeminent valuation methodology for executive stock options issued in the USA. The inputs into the Black-Scholes formula are the stock price, the exercise price, the annual dividend yield, the option term, the annual stock volatility (the annualized standard deviation of cumulative stock returns), and the annualized risk-free interest rate.

The Black-Scholes (1973) option valuation formula, modified to incorporate continuous dividend payments, is given by

$$\text{Option Value} = Pe^{-\ln(1+d)T}N(z) - Xe^{-\ln(1+r)T}N(z-\sigma\sqrt{T}),$$

where:

P = Grant-date stock price

X = Exercise price

T = Expiration term (years)

d = Annualized dividend yield

σ = Annual stock-price volatility

r = Risk-free interest rate

$$z = \frac{ln(P/X) + (ln(1+r) - ln(1+d) + \sigma^2/2)T}{\sigma\sqrt{T}}$$

N() = Cumulative normal distribution function.

The risk-free rate is typically defined as the annualized yield on government-issued securities maturing on the option's expiration date. Conceptually, dividend yields and stock-price volatilities correspond to anticipated yields and volatilities over the option term. As a practical matter, however, these parameters are typically computed based on historical data. For example, volatilities are most often defined as $\sqrt{12}$ times the standard deviation of ln(1+Monthly Return), measured over the prior 36, 48, or 60 months. Similarly, dividend yields are typically measured as the annualized yield over the past one, two, or three years.

The Black-Scholes option "delta" is the derivative of the Option Value with respect to the stock price, P:

$$\text{Option Delta} = e^{-ln(1+d)T}N(z),$$

The Black-Scholes Delta has often been used to measure the "incentives" executives have to increase the share price (since it indicates how much the value of the option increases for an incremental increase in the share price).

The Black-Scholes option "vega" is the derivative of the Option Value with respect to the volatility (often divided by 100 to indicate the change in the value of the option for a 1% increase in stock-price volatility):

$$\text{Option Vega} = Pe^{-ln(1+d)T}N'(z)\sqrt{T},$$

where $N'(z) = \frac{1}{\sqrt{2\pi}} e^{-z^2/2}$.

The Option Vega is related to the "incentives" executives have to increase the risk (since it indicates how much the value of the option increases for an incremental increase in stock-price volatility). The Option Vega is maximized when:

$$P = Xe^{-(ln(1+r)-\ln(1+d)-\sigma^2/2)T} .$$

For typical values of r, d, and σ, the Option Vega is highest when the stock price is close to the exercise price. For example, note that σ=.30, r=4.6% and d=0. Then

$$ln(1+r) - \ln(1+d) - \sigma^2/2 = -.000027$$

and the Option Vega is maximized when P = .99997X.

3. The Transatlantic Pay Divide: Is Europe Catching Up?[64]

3.1. Introduction (and some more history)

While executive compensation has sparked outrage in the USA from time to time since the 1930s, the European situation was much quieter until the mid-1990s. The different experiences on the two continents may in part reflect differences in pay practices: the USA practices might simply be more outrageous. Perhaps more importantly, the different reflects that detailed information on individual executive pay practices including stock options have been generally available in the USA since the 1930s, while similar information has only recently become widely available in Europe. Indeed, there is a curious circular relation between disclosure and outrage: outrage over perceived excesses in executive pay – usually stemming from a relatively isolated event – fuels demand enhanced disclosure, which in turn yields more opportunities to perceive isolated excesses leading to more even more disclosure.

In the UK, the "isolated event" related to the 1990 privatization of government-owned electric, gas and water utility companies. Executives in these utilities had received options to buy shares after at exercise prices initially undervalued by the government, leading to windfall option gains over the next several years. By mid-1992, the Labour Party became angered that executives in the privatized water industry had options worth over £20 million (about €37 mil in 2008-constant Euros[65]) at a time when customers were facing higher water rates.[66] The controversy intensified in early 1995, when it was revealed that over 100 executives in electric companies were set to gain in aggregate around £40 million (€63 mil in 2008-constant Euros) by cashing in options often ahead of their firms' initial public offering.[67] Several executives even partially avoided taxes on these gains by transferring

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64 This Section draws (in part) from Fernandes, et al. (2009), Conyon and Murphy (2000), and Conyon and Murphy (2002).

65 The historical numbers in this section are calculated somewhat convolutedly by converting into US dollars at the historical exchange rate, adjusting to 2008-constant dollars using the USA Consumer Price Index, and converting into Euros using the 2008 year-end exchange rate.

66 Ford, "Water chiefs' £20m shares windfall angers Labour," *Times* (June 1, 1992), p. T.

67 White and Milner, "Anger over utility chiefs' £40m share bonanza," *Guardian* (May 15, 1995); Calvert and Nelson, "Exposed: the utility chief millionaires," *Observer* (May 14, 1995).

shares to their wives.[68] The outrage over compensation practices in the privatized utilities led to the influential report by the Greenbury (1995) committee, which called for changes in the tax rules and structure of UK stock options, and significantly expanded disclosure rules for UK executive compensation.

In Germany, the "isolated event" related to UK-based Vodafone's hostile takeover of German-based Mannesman in 2000, at the time the largest corporate merger ever. On the day before Mannesman and Vodafone announced they had an agreement, Mannesman's supervisory board (led by Josef Ackermann, the CEO of Deutsche Bank) approved nearly €60 million in bonuses and severance payments to Mannesman's CEO Klaus Esser and other top executives. In 2003, Ackermann and other members of the supervisory board faced criminal charges for breaching their fiduciary duty by paying the bonuses; Esser – who was the primary beneficiary of the bonuses but did not take part in the decision process – faced conspiracy charges in connection of the bonuses. The presiding judge determined in 2004 that Ackermann's actions were atrocious but not criminal; prosecutors successful appealed the acquittal and the case was ultimately settled in 2006. However, the trial set off a campaign for more-transparent corporate governance in Germany, including legislation requiring historically secretive companies to disclose more details on their compensation packages.

Plans in France to make stock options more attractive through tax advantages were derailed in late 1999 after Elf's CEO Philippe Jaffre received a golden-parachute option payout of €30 million following Elf's acquisition by Totalfina.[69] One of the most vocal critics of Jaffre's golden parachute payment was Vivendi's CEO Jean-Marie Messier, who chastised Jaffre's payout in his 2000 autobiography, insisted this his own contract had no such clause, and promised his board that he would never negotiate one.[70] But Jean-Marie Messier's world was about to get, well, messier, as he personally added to the flap over executive compensation and excessive severance pay.

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68 Under UK tax laws at the time, option gains were taxed as capital gains when the stock was eventually sold, with a £6000 tax-free allowance, See Barrie, et al., "Fury as National Grid chiefs use loophole to avoid tax on share option profits," *Guardian* (May 26, 1995), p. 2.

69 Graham, "Fabius sets date for stock option plan," *Financial Times* (April 26, 2000a), p. 8; Delaney and Wessel, "Lumpy Gravy: Suppose Stock Options Involved More Pain Than Financial Gain – That's the Case in Europe, Which Helps to Explain High-Tech Lag There – `A Bit Perverted' in France," *Wall Street Journal* (December 21, 1999b), p. A1.

70 Harding and Johnson, "Messier can expect a rough ride over golden parachute exit package," *Financial Times* (July 4, 2002), p. 25.

Between 1994 and 2002, Messier had transformed a recently privatized water utility into one of the largest media conglomerates in the world through over €70 billion in acquisitions. Once France's best-known and most-admired businessmen, Messier was criticized after relocating to a €13 million apartment in New York City purchased with corporate funds (following Vivendi's acquisitions of Seagram and Universal).[71] After a €13.6 billion loss in 2001 (the largest in French corporate history) and a credit downgrade to near-junk status, Messier was pressured to resign from the company on 1 July 2002.[72] As part of his agreement to leave, Messier reputably broke his public promise and negotiated a controversial severance package worth €20.6 million, signed on behalf of Vivendi by Messier's close associate and chief operating officer. Reports of the severance pay caused an uproar in France, and Messier's successor at Vivendi ultimately refused to pay it, claiming that the agreement wasn't valid because it hadn't been approved by the full board or by shareholders as required under French law.[73] Messier sued the company for the severance, which in turn countersued Messier for damages. Finally, as part of a $51 million (€36 million) civil fraud settlement with the SEC against both Vivendi and Messier, Messier agreed to pay $1 million of the $51 million in fines and forgo his severance claim against Vivendi.

In the midst of the public dispute over Messier's severance pay, shareholders and more than 2,000 employees at Alstom – the recently privatized manufacturer of France's high-speed TGV train – held a rally demanding return of the "scandalous" €4.1 severance payments received by ousted CEO Pierre Bilger. Bilger had been removed from his post in March 2003, after being placed under judicial investigation for embezzlement and after his company lost €1.4 billion in the prior year, and 90% of its market value over the prior two years. In August 2003, the French government bailed out the company with a €2.8 billion rescue package in return a 31.5% stake in the company. Less than two weeks later, Bilger yielded to increasing public criticism and returned the €4.1 payment (which had been been fixed in 1999), explaining that he did not want to be the "subject of scandal."[74]

In Sweden, perceptions of exorbitant pension pay ruined the reputation of Percy Barnevik, who had led the Swiss-Swedish engineering giant ABB from 1988 through 2001.

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71 Carreyrou, "A French CEO's Taste For America Is Hard To Swallow Back Home --- Move to New York Was Faux Pas For Vivendi's Mr. Messier; A Rocker's Hail to the Chief," *Wall Street Journal* 2002), p. A1.

72 Johnson, "Messier under pressure from board to resign," *Financial Times* (July 1, 2002), p. 1.

73 Carreyrou (2003a); Carreyrou, "Vivendi, Messier to Pay $51 Million to Settle Charges," *Wall Street Journal* (December 24, 2003b), p. A3.

74 Harrison, "Ex-Alstom chief waived severance pay for "honour"," *Reuters News* (October 22, 2003).

Barnevik's November 2001 pension payment of €60 million sparked not only outrage by lawsuits, and Barnevik was eventually pressured to resign his posts as chairman of Investor (the investment vehicle for Sweden's Wallenberg dynastic) and AstraZeneca. To avoid lengthy litigation, Barnevik agreed to return 60% of his severance pay.

In the Netherlands, controversies erupted over massive overstatements of reserves by Royal Dutch Shell linked to its executive bonus formulas. Under Shell's "balanced scorecard" performance-measurement system, bonuses were paid in part on the basis of increases in reserves. In 2002 and 2003, Shell's internal auditor warned that Shell's booking of reserves did not comply with SEC guidelines, and argued that Shell's bonus system encouraged the inflation of reserves booking.[75] In January 2004, the stock price of Shell's two parent companies plummeted as Shell slashed its reported oil and natural gas reserves by 20%. Along with the restatement, Shell changed its bonus formula to remove any weight on reserves.

As executive compensation in Europe became more controversial, demand for increased pay disclosures intensified from labor unions, the government, and international investors. The most sweeping new rules were adopted by the UK following the Greenbury (1995) Report, which equalled and in many cases surpasses USA disclosure rules. In particular, the Greenbury Report required companies to list the details of all options held at year end (e.g., quantities, exercise prices, terms); the USA did not require these details until 2006.[76] The Greenbury report was followed by the Hampel (1998) report which required companies to report changes in the actuarial value of pension benefits, also not part of USA disclosure requirements until 2006.

In January 2000, all firms listed on the Irish Stock Exchange were required to reveal details of individual executive pay. But elsewhere in Europe, disclosure reform was uneven. Many large firms throughout the Continent cross-listed on USA or UK exchanges began voluntarily reporting compensation details, under the theory that more transparency would attract more USA and UK investors. But formally, several countries such as Spain and Italy had no reporting requirements, and reporting was encouraged but not mandatory in France.[77]

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75 Cummins, "Shell's Outside Auditors Got Warning on Reserves in 2002," *Wall Street Journal* (July 15, 2004), p. A3.

76 Under the 1992 USA disclosure rules, companies must report the number and intrinsic value of exercisable and nonexercisable options held at year end, but did not have to report details arising from each tranche of options.

77 In spring 2000, the *Mouvement des Entreprises de France* (or MEDEF) – essentially the union of the largest employers – encouraged public companies to voluntarily disclose pay. For details on European

While many large French companies complied with the voluntarily guidelines, others (such as PSA Peugeot-Citroen) vowed to never voluntarily disclose their pay. In any case, there were no specific French disclosure guidelines, and as a result there was substantial dispersion on *how* firms chose to report pay (even among those that chose).

Under rules in effect until 2005, public companies in Germany were required to report only the aggregate cash compensation paid to all management directors; details on individual compensation or on stock options were not required. In 2000, following the Ackermann-Mannesman scandal discussed above, Germany legislators began working on sweeping new pay disclosures that would reveal individual pay packages. However, the landmark German disclosure legislation was not passed until 2005, requiring details on option grants but not option holdings, and also included a loophole to benefit secretive family-owned or closely held corporations: the company would not have to disclose pay details if 75% of the shares vote against such disclosure.[78]

On 21 May 2003, the Commission of the European Communities issued its report entitled, "Modernizing Company Law and Enhancing Corporate Governance in the European Union - A Plan to Move Forward" (the "Action Plan"). The Action Plan – directed at corporations in the fifteen countries (as of 2003) represented in the European Union[79] – included four guiding principles:

- Disclosure of compensation policies in annual reports;
- Disclosure of details of remuneration of individual directors in the annual accounts;
- Prior approval by the shareholder meeting of share and share option schemes in which directors participate;
- Proper recognition in the annual accounts of the costs of such schemes for the company;

Member countries were asked to implement the Action Plan by June 2006, either through legislation or best-practice rules based on the "comply or explain" principle: the

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disclosure as of September 2000, see Woodruff, "A Vanishing European Taboo: Disclosing Executives Pay --- Goal of Single Market, Pressure Abroad Help; Response Is Unexcited," *Wall Street Journal* (September 11, 2000).

78 See Simensen, "Debate Over Remuneration Has Led To Changes In German Corporate Governance," *Financial Times* (October 23, 2006), p. 23; "Germany's pay law: Disclosure is right - but anti-business rhetoric is futile," *Financial Times* (May 20, 2005), p. 18.

79 The fifteen country-members of the European Union as of May 2003 were Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

Table 3.1 Compliance with Action Plan as of June 2009

Country	Disclosure of Compensation Policies	Disclosure of Compensation for Individual Executives	Detailed Individual Disclosure of Stock Options	Countries with 2008 CEO BoardEx Pay Data	
				Number of Firms	% of Mkt Cap
Austria	yes		[2]	4	22.4%
Belgium	yes	yes	yes	47	57.1%
Denmark	yes	yes	yes	8	37.2%
France	yes	yes	yes	218	77.8%
Germany	yes	yes[1]	yes[1]	125	78.5%
Greece		[2]		4	12.1%
Ireland	yes	yes	yes	56	98.8%
Italy	yes	yes	yes	83	85.1%
Luxembourg	yes	[2]	[2]	5	18.4%
Netherlands	yes	yes	yes	84	75.7%
Portugal	yes	yes		5	28.5%
Spain	yes	yes		31	66.3%
Sweden	yes	yes	yes	74	69.0%
United Kingdom	yes	yes	yes	1180	91.4%

Note: The table shows results for the 15 countries with EU membership as of the 2003 Action Plan, based on data from RiskMetrics (2009) and EU Commission (2007). Some countries have different rules for different individuals (e.g., executives vs. non-executive board members, or chief executives vs. other executives). The information in the table reflects required disclosures for the CEO.

[1]Under German law, individual disclosure is not mandated if 75% of the shares vote against disclosure.

[2]Disclosures required on an aggregate basis (not for individual executives).

company should either comply with the guidelines or offer compelling explanations of why they choose not to. Table 3.1 summarizes the compliance with the EU disclosure guidelines as of June 2009, based on information from RiskMetrics (2009) and EU Commission (2007). In practice, most large publicly listed European countries complied with the recommendations of the 2003 Action Plan by 2005 or 2006, regardless of whether compliance for mandated by their particular jurisdiction. Among the last holdouts was Germany; prior to passing its own mandatory rules in 2005, only 9 of the top 30 firms voluntarily disclosed their compensation.[80]

The second-to-last column in Table 3.1 summarizes the number of companies in each country with full CEO compensation information as collected and reported in Management Diagnostics Limited's BoardEx database (our primary source of compensation data analyzed in the next section). The final column shows the aggregate market capitalization of the

80 "Germany: Keeping stumm over executive pay," *Economist Intelligence Unit* (August 19, 2004), p. 2.

companies with individual compensation available in BoardEx (which is a lower bound on companies disclosing individual compensation information) as a percentage of the total market capitalization in the company (based on Datastream aggregates). Not surprisingly, the observations are concentrating in countries that have adopted EU disclosure recommendations, or (like the UK) have adopted even more stringent disclosure rules. In particular, the companies followed by BoardEx account for over 80% of market capitalization in countries with full individual disclosure (including options), but less than 25% of the market capitalization for the European countries without full disclosure.

In this Section, we use data emerging from the recent EU disclosure rules to conduct a comprehensive cross-country analysis of executive compensation in Europe, and contrast European pay levels and practices with those in the US. We being by describing the level and composition of European CEO pay in 2008, focusing on the how pay varies with both company size and industry. Next, we document the USA "Pay Premium," showing that USA CEOs received about double the pay of their European counterparts in 2008, even after controlling for company size and industry.

3.2. Executive Compensation in Europe (vs. USA)

Prior research on European vs. USA differences in executive pay have been hampered by a lack of consistent and detailed data for individual CEOs. As a result, most research prior to the 2003 EU disclosure rules (or the earlier UK rules) focused in large part on average cash compensation for a group of executives. For example, Conyon and Schwalbach (2000)'s comparison of UK and German compensation from 1968-1994 focused on only cash compensation for the UK (because the study predated the Greenbury (1995) recommendations on disclosing stock options) and average cash compensation for Germany (because German rules required only disclosing the total cash paid across the group of top managers). Similarly, Muslu (2008)'s study of the largest 158 European companies from 1999-2004 (based on hand-collected annual reports) presents a mixture of individual and aggregated compensation data. More recently, Bryan, Nash and Patel (2006) relied on SEC Form 20-F filings from 1994-2004 for foreign companies cross listing in the USA. However, cross-listed companies are only required to disclose compensation for individual executives if such disclosure is required in the home country, and as a result most of their analysis was based on average compensation for the management group.

Another branch of research on international pay – notably Abowd (1995), Abowd and Kaplan (1999), Murphy (1999), and Thomas (2008) – relied on Towers Perrin's biennial *Worldwide Total Remuneration* reports. These are not based on "data" per se, but rather depict the consulting company's estimates of "typical" or "competitive" pay for a representative CEO in an industrial company with an assumed amount in annual revenues, based on questionnaires sent to consultants in each country.[81] While these reports have provided valuable information about cross-country pay differences, they are not useful (for example) in understanding how pay varies with (for example) company size, industry, governance, or managerial characteristics.

The enhanced disclosure rules in Europe finally make it possible to conduct comprehensive cross-country analyses of executive compensation based on individual CEOs and including equity and option grants. Conyon and Murphy (2000) were among the first to conduct such as study, analyzing the differences in UK and USA practices in 1997 (following the implementation of the Greenbury (1995) recommendations). More recently, Fernandes, Ferreira, Matos and Murphy (2009) were among the first to exploit the increasingly favorable disclosure environment in their analysis of 2006 CEO compensation in 27 countries (including 14 European countries).

The evolving international evidence on executive compensation – particularly those based on the Towers Perrin reports or the new disclosure environments – have consistently concluded that USA CEOs are paid significantly more than their foreign counterparts after controlling for company size, industry, and a variety of other firm and managerial characteristics. Moreover, USA executives receive a greater share of their compensation in the form of stock options, restricted shares and performance-based bonuses. We begin our analysis of European compensation by replicating these stylized facts, and then turn to explaining them.

3.2.1. The Data

Our data source for European CEO pay data is "BoardEx," compiled by the UK-based firm Management Diagnostics Limited. BoardEx is the leading database on board

[81] The amount iof annual revenues ncreased with inflation over time, but was generally in the range of US $250 million - $500 million).

composition of publicly listed firms, and includes detailed biographic information on individual executives and board members in nearly 50 countries (including countries that do not have mandatory disclosure requirements for executive compensation).[82] We restrict our analysis to the individual identified by BoardEx as the highest-ranking executive in each firm, and use the term "CEO" to describe this executive, regardless of whether the firm uses "chief executive officer" or some other designation (such as "managing director" or "executive chairman"). In addition to providing biographic information, BoardEx also includes detailed compensation data for top executives – including salaries, other pay, bonuses, payouts under long-term plans, option grants, and share grants.

We focus on the nine countries in Table 3.1 that had codes or laws requiring the disclosure of cash and share-based compensation for individual executives: Belgium, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden, and the UK. In addition, we include Switzerland, which while not a member of the European Union nonetheless adopted EU-style disclosure rules.[83] In the case of Switzerland, individual compensation is reported only for the "highest-paid" executive who might not be the CEO. For our USA comparisons, we rely on Standard and Poor's ExecuComp database, as we did in Section 2. However, while we restricted our analysis in Section 2 to the S&P 500 (essentially the 500 largest firms ranked by market capitalization), we now employ the entire ExecuComp database, which also includes firms in the S&P MidCap 400, and S&P SmallCap 600, additional firms that ExecuComp continues to follow even after dropping out of one of their major indices. Finally, we restrict our analysis to companies with annual revenues in excess of €100 million to reduce the impact of BoardEx's over-sampling of small UK firms.

Two aspects of BoardEx's compensation calculation deserve special mention. First, instead of providing grant-date values for stock option grants (as in ExecuComp for our USA firms), BoardEx computes the value of options granted using the closing stock price on the last trading day of the fiscal year rather than the stock price on the grant date. Since world stock prices declined at the end of 2008, valuing options using fiscal year-end stock prices (a la BoardEx) produces a slightly lower value than using grant-date prices (a la ExecuComp). Second, for performance share plans (in which the number of restricted shares awarded is based on realized performance), BoardEx computes the value based on the maximum (rather

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82 The BoardEx data are used in Cohen, et al. (2008) to study links between CEOs and mutual fund managers in the U.S. and in Ferreira and Matos (2008) to study board links between banks and firms worldwide.

83 Under Switzerland regulations, companies must disclosure the pay for the "highest-paid executive" who might not be the CEO; our compensation data for Switzerland therefore potentially upward biased.

than the target or minimum) shares that can be awarded under the plan, again multiplied by the end-of-fiscal-year closing stock price. Using the maximum shares rather than the target shares will obviously overstate the value of performance shares, while valuing them at the end of the 2008 fiscal year (given the year-end decline in stock prices) will understate the value of the shares relative to their grant-date value.

Since one of our objectives is to quantify the magnitude of the USA Pay Premium (which might be affected by differences in BoardEx and ExecuComp methodologies), we calculated the ratio of the BoardEx stock and option variable to the ExecuComp stock and option variable for a sample of USA firms where we had both BoardEx and ExecuComp data.[84] While the median and average ratio was greater than one – indicating an upward bias in the BoardEx data – the differences from unity were not significant. These upward biases will work against us finding a USA Pay Premium.

Table 3.2 reports the level and composition of 2008 CEO total compensation, by country and for Europe collectively. Also, in anticipation of our results for UK CEOs (which often share more similarities with USA CEOs than their counterparts in in the rest of Europe), we provide results for Europe without the UK. Our full sample includes 1,074 European and 1,504 USA firms. Total pay is defined as the sum of salaries, bonuses, benefits, and the value of stock options and other shares granted to executives during the 2008 fiscal year. European data are as reported by BoardEx (and subject to the qualifications discussed above), while USA data are as reported in ExecuComp and discussed in detail in Section 2. The average and median pay for our USA sample (€4.1 mil and €2.6 mil, respectively) are considerable smaller than the corresponding numbers in Figure 2.2 (€7.3 mil and €5.4 mil, respectively), reflecting the fact that Figure 2.2 was based only on the largest 500 firms (i.e, the S&P 500 index) while Table 3.2 is based on a much broader sample (i.e, the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indicies). Nonetheless, Table 3.2 shows that average and median pay for USA CEOs are more than double the average and median pay for European CEOs (€2.0 mil and €1.2 mil, respectively).

The right-hand portion of Table 3.2 describes the average composition of CEO pay in the eleven countries. On average, CEOs in Europe receive 50% of their total pay in the form of base salaries, 20% in bonuses, 3% in stock options (valued at grant-date), and 16% in restricted stock or performance shares. In contrast, the four major components of CEO pay (salaries, bonuses, options and stock) are fairly evenly divided for USA CEOs. Even given

84 We conducted this test using only companies included in the Morgan Stanley Capital International (MSCI) Index.

Table 3.2 Summary Statistics the Level and Structure of 2008 CEO Compensation, by Counnry

Group	Sample Firms	Total Pay		Average Composition of Total Pay				
		Average (€000s)	Median (€000s)	Base Salary	All Bonuses	Option Grant	Stock Pay	Other Pay
Belgium	37	1,300	906	59%	18%	7%	4%	12%
France	192	1,492	839	60%	22%	8%	6%	4%
Germany	108	2,353	1,445	41%	37%	2%	8%	13%
Ireland	33	2,210	1,375	50%	10%	4%	20%	15%
Italy	72	2,159	1,405	56%	16%	6%	3%	19%
Netherlands	70	1,455	1,096	51%	20%	5%	11%	13%
Spain	28	1,752	801	66%	11%	1%	2%	20%
Sweden	59	1,191	970	61%	16%	0%	1%	22%
Switzerland	35	3,483	1,336	57%	17%	0%	12%	14%
United Kingdom	440	2,210	1,256	42%	18%	1%	29%	9%
All Europe	1,074	1,986	1,178	50%	20%	3%	16%	11%
Europe excluding UK	634	1,829	1,108	55%	21%	5%	7%	11%
United States	1,504	4,098	2,615	28%	20%	20%	27%	6%

Note: European data from Boardex and US data from ExecuComp exclude firms with less than €100m in 2008 revenues. Total compensation defined as the sum of salaries, bonuses, benefits, and grant-date values for stock options, restricted stock, and performance shares. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

the decline in stock options and rise in restricted stock in the USA documented in Section 2, the use of stock options is substantially higher in the USA than in any European country, while the use of stock in the USA is less than its use in the UK (where stock grants tend to be "performance shares" as discussed below in Section 3.4).

3.2.2. The Level and Composition of Pay, by Size and Industry

Within the European sample, Table 3.2 suggests that the group of countries with the highest average and median pay include Germany, Ireland, Italy, Switzerland, and the UK. However, before taking the results in Table 3.2 too seriously, we need to take into account differences in company sizes across countries (especially since the sampling by BoardEx is not random, as indicated by the over-sampling of smaller British firms in Table 3.2 even after imposing the €100 mill revenue floor).

Table 3.3 Distribution of 2008 Revenues for Sample Firms (€mil), by Country

Country	Mean	Percentiles			Estimated Pay-Size Elasticity
		25th	50th	75th	
Belgium	6,016.70	329.8	780.6	3,028.10	.138
France	8,132.8	452.9	1,187.1	5,510.8	.342***
Germany	13,024.5	636.0	2,016.3	12,401.4	.394***
Ireland	3,568.7	355.0	1,306.4	4,685.2	.503***
Italy	8,370.0	1,003.3	1,977.9	4,461.3	.337***
Netherlands	6,665.7	530.7	1,582.6	3,853.6	.248***
Spain	12,785.0	904.9	4,163.3	13,087.6	.285
Sweden	3,218.4	229.8	1,111.0	3,172.3	.369***
Switzerland	10,631.3	994.6	3,831.9	12,598.1	.309**
United Kingdom	3,741.6	207.6	536.9	1,817.3	.387***
All Europe	6,465.6	323.4	986.6	3,671.8	.315***
United States	5,341.2	498.6	1,302.3	3,999.2	.394***

Note: The figure reports the distribution for company revenues (in €mil) for the firms in Table 3.2. The pay-size elasticity is defined as the estimated coefficient on Ln(Lag Sales) in a regression of Ln(CEO Pay) on Ln(Lag Sales) and five industry dummy variables. The number of companies for each country is the same as in Table 3.2.

,* indicates that the pay-size elasticity is significantly different from zero at the 5% and 1% levels, respectively.

Table 3.3 shows the distribution of 2008 revenues (in €millions) for our 2,578 sample firms. In interpreting the differences in the USA and European firm sizes, it is instructive to note that the ten European countries have a total population of 364 million (2010 est.) and total gross domestic product of €10.1 trillion (2009 estimate by the International Monetary Fund). In comparison, the USA has a slightly smaller population (309 million) and nearly identical GDP (€10.2 trillion). Therefore, the overall economies of the USA and of our 10-country representation of Europe are quite similar, and yet (as suggested by Table 3.3), the organization of economic activities is quite different. In particular, the median revenues of the 1,504 USA firms are 30% higher than the median for Europe, while the *average* revenue is 20% higher in Europe. The implication is that, while the USA has more large firms, the largest firms were concentrated in Europe. For example, while even the 75th firm is larger in USA, 30 of the 50 largest firms (ranked by 2008 revenues) are headquartered in Europe.

The best-documented empirical finding in the executive compensation literature is the relation between CEO pay and company size, typically measured as the elasticity of

compensation to company revenues. Nearly two decades ago, Rosen (1992) summarized academic research covering a variety of industries and a variety of time periods in both the US and the Europe, and observed a consistent empirical elasticity of around 0.3, implying that doubling compensation increases pay by about a third. Even though there is some variation in wage-size elasticities, his general conclusion is that the "relative uniformity [of estimates] across firms, industries, countries, and periods of time is notable and puzzling because the technology that sustains control and scale should vary across these disparate units of comparison." The final column of Table 3.3 replicates these earlier findings for our 2008 CEO pay data, with pay-size elasticities η estimated from the regression:

$$\text{Ln(2008 CEO Pay)} = \alpha + \eta \text{ Ln(2007 Sales)} + \boldsymbol{\beta}'(\textbf{Industry}),$$

where Industry is a set of six industry dummy variables based on Fama-French definitions.[85] The pay-size elasticity is positive and highly statistically significant in all countries except for Belgium and Spain. The overall elasticity for Europe (.315) is slightly smaller than that for the USA (.394), but nonetheless highlights the importance of controlling for firm size in comparing CEO pay across countries and companies.

[85] We modify the 5-Portfolio Fama-French classification by creating a sixth for financial services. Our categories are Consumer Goods (including durables, non-durables, wholesale, retail, and some services); Manufacturing (including energy and utilities); Hi-Tech (including business equipment, telephone and television transmission, and computer-related services); Health (including healthcare, medical equipment, and drugs); and Other (including mines, construction, transportation, hotels, business services, and entertainment).

Table 3.4 Summary Statistics for 2008 CEO Total Compensation, by Company Size

Group	Sample Firms	Total Pay		Average Composition of Total Pay				
		Average (€000s)	Median (€000s)	Base Salary	All Bonuses	Option Grant	Stock Pay	Other Pay
EUROPE	1,074	1,986	1,178	50%	20%	3%	16%	11%
By Firm Sales (millions)								
Less than €350	289	889	677	56%	15%	3%	15%	11%
€350 to €1,000	252	1,226	974	53%	21%	2%	15%	9%
€1,000 to €4,000	275	2,007	1,387	48%	23%	3%	16%	11%
Above €4,000	258	3,933	2,660	42%	22%	6%	19%	12%
UNITED STATES)	1,504	4,098	2,615	28%	20%	20%	27%	6%
By Firm Sales (millions								
Less than €350	245	1,448	1,010	40%	18%	17%	19%	6%
€350 to €1,000	407	2,213	1,668	33%	18%	17%	26%	5%
€1,000 to €4,000	476	4,020	3,106	25%	21%	21%	27%	5%
Above €4,000	376	7,964	6,225	17%	21%	24%	32%	6%

Note: European data from Boardex and US data from ExecuComp exclude firms with less than €100m in revenues. Total compensation defined as the sum of salaries, bonuses, benefits, and grant-date values for stock options, restricted stock, and performance shares. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919). The average (and median) results for all firms in Europe and in the USA are reported in Table 3.2.

Table 3.4 provides summary statistics for the level and composition of fiscal 2008 CEO pay by company size and continent. As reported in the top panel, the average and median levels of total compensation increase monotonically with firm size: the median pay for companies with 2008 revenues in excess of €4 billion is €2.7 million, far larger than the €677,000 median pay for companies with revenues below €350 million. The bottom panel shows that American CEOs earn substantially more than their European counterparts, for every size and industry group. The USA premium is especially pronounced for large firms (where the median US CEO earns 340% more). The right-hand portion of Table 3.4 describes the average composition of CEO pay in the two continents. The divergence in equity-based pay between European and USA pay practices is, again, especially pronounced for companies with revenues exceeding €4 billion. Within this group, salaries account for 42% of pay for European CEOs, but account for only one-sixth of pay for USA CEOs. Similarly, equity-based pay accounts for 56% of pay for CEOs in large US firms, but only account for 25% of pay in the largest European firms.

Table 3.5 Summary Statistics for Components of 2008 CEO Pay, by Company Size

Group	Base Salary	Annual Bonus Received		Value of Option Grant		Value of Shares	
	Median (€000s)	% with Bonus	Median (for >€0)	% with Grants	Median (for >€0)	% with Grants	Median (for >€0)
EUROPE							
By Firm Sales (millions)							
Less than €350	349	62%	173	14%	22	44%	283.4
€350 to €1,000	448	72%	286	16%	11	45%	396.6
€1,000 to €4,000	593	71%	453	12%	224	44%	543.9
Above €4,000	960	69%	857	20%	797	50%	1,156.3
UNITED STATES							
By Firm Sales (millions)							
Less than €350	336	74%	267	47%	424	48%	497.0
€350 to €1,000	459	73%	409	51%	576	63%	715.7
€1,000 to €4,000	607	82%	703	62%	1,073	70%	1,214.9
Above €4,000	787	76%	1,460	68%	2,096	73%	2,812.8

Note: Median data for bonuses, options, and stock represent the median value of award/grant (in €000s) for the subsample of CEOs actually receiving awards/grants during the 2008 fiscal year. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

Table 3.5 compares base salaries and the prevalence of contingent-pay practices in the two continents. Median base salaries for CEOs are fairly similar on both sides of the Atlantic, and the percentage of CEOs receiving bonuses in 2008 was only slightly higher in the USA. However, conditional on receiving a bonus, USA bonuses are much higher: the median bonus paid in the US of €603,000 is 60% higher than the median bonus paid in Europe. American CEOs are more likely to receive option grants than their European counterparts (58% in the USA versus only 15% in Europe). In addition, they are likely to receive much larger grants: the median option grant in the US (for CEOs receiving options) of €950,000 is *ten times* the median grant value for European CEOs (who receive only €95,000). Finally, Table 3.5 shows that 45% of European CEOs receive restricted stock or performance shares, while 65% of US CEOs receive similar grants. The value of the grant (for those receiving grants) is much higher in the USA (€1,215,000 vs €490,000).

3.2.3. Pay-Performance Relations

In Section 2.3.1, we noted that the relation between CEO wealth and shareholder wealth for USA executives primarily reflects their holdings of stock and options. Table 3.6 presents estimates of "CEO Wealth" (defined as the year-end value of stock and option holdings) for European and USA executives, based on ExecuComp-based calculations for

USA CEOs and BoardEx calculations for European CEOs; BoardEx estimates are available for 70% of our sample executives.[86] Table 3.6 shows the median CEO Wealth expressed in euros and also as a fraction of cash compensation (salary and short- and long-term bonuses) and the company's market value of equity. Since the stock-market crash in late 2008 substantially impacted CEO Wealth (especially the value of stock options), we show CEO Wealth both pre-crash (2006) and mid-crash (2008). We provide results by country, for Europe taken as a whole, and for Europe without the UK.

As shown in Table 3.6, the median European CEO held €1.9 million in stock and options at the end of 2008, down from €4.2 million two years earlier.[87] In comparison, the median USA CEO held €7.0 million in stock and options at the end of 2008, down from €20.0 million in 2006. Expressed as a ratio of cash compensation, the median European CEO held stock and options worth about 4.1 times cash pay in 2006, and 2.2 times cash pay in 2008, while the corresponding ratios for USA CEOs was 14.3 and 6.3. Finally, expressed as a percentage of the market value of outstanding equity, the median European CEO's wealth was .29% and .33% in 2006 and 2008, respectively, compared to .98% and .65% for USA executives over the same time period.

The difference between the stock and option holdings of USA and European CEOs is even more dramatic after excluding data for UK executives, who look much more like their USA counterparts than they do their European counterparts. As shown in Table 3.6, the median CEO in Continental Europe held options and stock worth only €1.2 in 2008, representing 1.3 times the median CEO's cash compensation, and .09% of the value of the firm's outstanding equity. For comparison, the median UK CEO held options and stock worth only €1.9, representing 2.2 times the median CEO's cash compensation, and .62% of the value of the firm's outstanding equity.

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86 Year-end vaues for unrestricted and restricted stockholdings for our USA CEOs are calculated as the number of shares held multiplied by the year-end stock price. The year-end value of stock options for USA CEOs are calulated using the Black-Scholes formula for each option held at year-end, using 70% of the remaining term as an ajustment for early exercise. BoardEx defines year-end values as "the value of total equity held + value of LTIP held + estimated market value of options held"). We have not obtained BoardEx CEO Wealth data for Ireland or Switzerland, and these countries are therefore left out of the analysis.

87 The distribution of holdings is naturally skewed: the *average* European CEO (not reported in the Table) held €37.0 million and €21.7 million in stock and options in 2006 and 2008, respectively.

Table 3.6 CEO Wealth in Company Stock and Options in 2006 and 2008, by Country

Country	Firms (2008)	Median CEO Wealth in Stock and Options (€mil)		Median Ratio of CEO Wealth to Salary and Bonus		Median Ratio of CEO Wealth to Market Value	
		2006	2008	2006	2008	2006	2008
Belgium	10	€0.6	€0.5	0.7	0.9	0.03%	0.05%
France	141	4.0	1.3	3.8	1.5	0.09%	0.13%
Germany	48	0.9	1.7	0.8	1.6	0.05%	0.11%
Italy	52	4.9	1.3	3.2	1.2	0.12%	0.05%
Netherlands	55	3.2	1.4	2.7	1.6	0.11%	0.15%
Spain	17	1.9	0.6	3.2	0.7	0.02%	0.02%
Sweden	46	0.8	0.3	1.0	0.5	0.03%	0.07%
United Kingdom	382	5.7	2.3	5.2	3.0	0.56%	0.62%
All Europe	751	4.2	1.9	4.1	2.2	0.29%	0.33%
Europe excluding UK	369	2.6	1.2	2.4	1.3	0.07%	0.09%
United States	1493	20.0	7.0	14.3	6.3	0.98%	0.65%

Note: CEO Wealth is defined as the fiscal year-end value of the CEO's stock, restricted stock, and the Black-Scholes value of stock options. Sample includes all companies from Table 3.2 where their are sufficient data to calculate year-end portfolios. European data are from BoardEx; USA data (including Black-Scholes values) are calculated by us based on year-end option holdings. Market Value is the year-end market value of the firm's equity. Monetary amounts are in 2008-constand Euros. CEOs with zero holdings of stock and options are excluded. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

In Section 2.3.1, we measured pay-performance sensitivities based on each executive's year-end holdings of stock, options, and restricted stock. We constructed "Effective Ownership Percentages" by weighting each option by its "Option Delta" (that is, the change in the value of the option associated with an incremental change in the stock price). For CEOs without stock options, the ratio of CEO Wealth to Market Value in Table 3.6 will be equivalent to our measure of effective ownership. However, for executives holding options, effective ownership will be higher than the ratio Table 3.6. For example, an option that is well in the money will provide effective ownership equal to a share of stock, and yet the value of the option will always be less than the value of the share of stock. Similarly, since the value of an option falls faster than the Option Delta as stock prices fall, an option that is well out of the money will also provide effective ownership in excess of the value of that option divided by the market value of the outstanding equity. For example, for the USA

executives in Table 3.6, the delta-weighted effective ownership for 2006 and 2008 is 1.31% and .88%, respectively, considerably higher than the .98% and .65% percentages reported.

Although some European countries (e.g., the UK) require detailed year-end disclosures of stock and option positions, these data are not available to us through the BoardEx database. Therefore, we cannot compute effective ownership percentages for our European CEOs analogous to our USA analysis in Section 2.3.1. However, since options are a small part of the compensation for European CEOs compared to USA CEOs (see the 2008 pay compositions in Table 3.2; these patterns are similar to what we observe for 2005 - 2007), we can conclude that the ratio of CEO Wealth to Market Value in Table 3.6 is approximately the effective ownership for European firms, but understates effective ownership for USA firms. Therefore, direct incentives to increase shareholder wealth are orders of magnitude higher in the US than for Continental Europe.

In measuring incentives in using effective ownership, we explicitly ignore management incentives associated with performance-based bonuses. For USA CEOs, we justified ignoring bonus-based incentives because of prior research showing that most of the year-to-year variation in CEO wealth reflects changes in the value of his portfolio of stock and options and not from cash compensation. However, given the relative absence of direct incentives through stock and option ownership in Continental Europe, we now to investigate the extent to which European firms substitute cash-based incentives for stock-based incentives.

Following Murphy (1985) and Coughlan and Schmidt (1985), we estimate "pay-performance elasticities" for CEO bonuses by estimating the percentage change in CEO compensation associated with percentage change in shareholder wealth, as follows:

$$\Delta\ln(\text{CEO Cash Compensation})_{it} = \alpha + \beta_1 \Delta\ln(\text{Shareholder Value})_{it},$$

where $\Delta\ln(\text{Cash Compensation})_{it}$ is the continuously compounded percentage change in CEO cash compensation (base salary plus bonuses) and $\Delta\ln(\text{Shareholder Value}) = \ln(1+\text{Shareholder Return})$ is the continuously compounded shareholder return (including dividends). We also estimate the pay-performance elasticity with respect to firm revenues:

$$\Delta\ln(\text{CEO Cash Compensation})_{it} = \alpha + \beta_2 \Delta\ln(\text{Firm Revenues})_{it},$$

and estimate the relation between percentages changes in CEO pay and the change in the firms' accounting return on assets:

$$\Delta\ln(\text{CEO Cash Compensation})_{it} = \alpha + \beta_3 \Delta\text{ROA}_{it},$$

where the return on assets is defined as (Net Income before extraordinary items plus interest paid) divided by the book value of assets.[88]

Table 3.7 shows our estimated pay-performance elasticities based on 2003-2008 time-series data. Change in (the logarithm of) cash compensation are computed only if the same CEO is in office in both years; all data are in euros and adjusted for inflation. All regressions include industry controls and year dummy variables for 2005 and 2008. The first columns show the country and the number of CEO-years of pay-changes used in the regressions. The middle panel provides results when based on separate regressions for each performance measure, while the right-hand panel includes all three performance measures (stock return, sales growth, and changes in ROA) in one regression.

Based on the separate regressions in the middle panel of Table 3.7, the pay-performance elasticity for shareholder return among European firms is significantly positive only for Germany, the UK, and Europe collectively; increasing shareholder value by 10% corresponds and increase in cash compensation of approximately 2.7% and .7% in Germany and the UK, respectively. The estimated elasticity is insignificant for Europe after excluding the UK and Germany. Similarly, the separately estimated pay-performance sensitivities for sales growth are also only positive for the UK, Germany, and (marginally) for Italy; the result for Europe is insignificant after excluding the UK and Germany. Changes in compensation are postively related to changes in the accounting return on assets in France, Germany, Ireland, the Netherlands, the UK, and Europe as a whole.

For the USA – estimated in the bottom row of Table 3.7, cash bonuses are not related to shareholder return, but are strongly related to both sales growth and accounting returns in both the separate and combined regressions. The estimated sales-growth elasticity of .430 suggests that each 10% increase in revenues corresponds to a 4.3% increase in cash compensation, while the ΔROA coefficient of .450 implies that a 10 percentage point increase in ROA is associated with a 4.5% pay increase. The insignificant elasticity for shareholder return is much lower than reported in the prior literature (e.g., Murphy (1999)), perhaps reflecting that the increase in equity-based compensation in the USA since the 1990s diminishes the need to have bonuses vary with stock-price performance.

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[88] For expositional symmetry, we will refer to β_3 as the "elasticity of CEO pay with respect to return on assets," even though it does not have the usual interpretation as an elasticity (i.e. the percentage change in one quantity with respect to a percentage change in another quantity). Also, we use ΔROA rather than ROA because accounting earnings follow an approximate random walk such that shareholder returns are most comparable to the changes rather than the levels of ROA.

Table 3.7 Estimated Pay-Performance Elasticities for Shareholder Return, Accounting Return on Assets, and Sales Growth, by Country

Country	CEO-Years	Pay-Performance Elasticities based on separate regressions for each performance measure			Pay-Performance Elasticities based on a single regression including all three performance measures		
		Stock Return	Sales Growth	Change in ROA	Stock Return	Sales Growth	Change in ROA
Belgium	94	.062	-.081	1.597	.002	-.181	1.805
France	838	.045	-.055	.867**	.046	-.087	.868***
Germany	301	.273***	.544***	1.450**	.220**	.399*	1.002*
Ireland	161	.027	.063	.809***	-.006	.043	.805**
Italy	252	.150	-.310*	-.269	.141	-.302	-.241
Netherlands	345	.039	.024	.491**	.029	.021	.465
Spain	102	-.160	-.047	-1.118	-.143	-.024	-.740
Sweden	329	.112	.121	.624	.074	.076	.464
Switzerland	87	.195	.176	2.685	.109	.106	2.425
United Kingdom	2506	.074***	.115***	.640***	.057***	.116***	.604***
All Europe	5015	.066***	.082***	.692***	.050***	.071**	.646***
Europe excluding UK and Germany	2208	.0414	-.046	.701***	.036	-.069	.691***
United States	8130	.002	.430***	.450***	.001	.404***	.394***

Note: Data are based on first-differences from 2003-2008. Pay-Performance elasticities are calculated from a regression of ΔLn(CEO Pay) on one or all three performance measures; regressions include additional controls for industry (five dummy variables based on Fama-French industries) and year (dummy variables for 2005 through 2008). For the purposes of these regressions, $(\text{Stock Return})_t$ is defined as Ln(1+Shareholder Return) for period t; ΔROA is defined as the year-over-year change in ROA (defined as net income before extraordinary items plus interest divided by average assets over the year); and sales growth is defined as $\Delta\text{Ln}(\text{Sales})_t$. Monetary data are converted to 2008-constant US dollars, adjusted for inflation, and then converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

*,**,*** indicates that the pay-performance elasticity is significantly different from zero at the 10%, 5% and 1% levels, respectively.

The right-hand panel of Table 3.7 reports pay-performance elasticities based on a single regression with all three performance measures. The results are quite similar to the separately estimated elasticities in the middle panel, and none of our inferences change. After excluding Germany and the UK, there is no evidence that bonuses for European CEOs is related to stock-price performance or sales growth. There is some evidence that bonuses vary with changes in accounting performance.

Implicit in the pay-performance regression in Table 3.7 is the assumption that bonuses reflect contemporaneous performance (for example, the effect of 2007 performance is assumed to be reflected in the 2007 bonus). Under SEC rules in the USA, bonuses are reported for the year bonuses are earned, and not when they are paid. For example, the bonus for 2007 may have been paid in early 2008 after the audited financial results are finalized, but that bonus is reported as 2007 and not 2008.[89] Therefore, the assumption is valid in the USA, but not be valid (or uniform) across Europe. To address this measurement issue, we re-estimated the regressions underlying Table 3.7 using lagged instead of contemporaneous performance measures, and also after including *both* contemporaneous and lagged variables. We found that the coefficients on the lagged performance variables were almost never significant, and did not change any of our conclusions based on Table 3.7.[90]

Another concern related to the results in Table 3.7 is that they include the mid-crash year 2008 and may not be indicative of long-run performance. For example, in the USA several firms with formula-based bonus plans switched to discretionary payouts in 2009 (for 2008 performance) because the formula-based payouts were deemed insufficient. We partially control for this issue in Table 3.7 by incuding a dummy variable for 2008. In addition, we re-estimated Table 3.7 after excluding data from the 2008 fiscal year, and obtained similar results.

In their investigation of CEO incentives based on 1974-1986 data from USA CEOs, Jensen and Murphy (1990a) concluded that USA CEOs were paid like bureaucrats: CEOs had low holdings of stock and options, and their bonuses varied little with performance (indeed, varied little at all regardless of performance). Subsequent research using later data – including Hall and Liebman (1998), Frydman and Jenter (2010), and our own results in Section 2 – indicate that USA CEOs are no longer paid like bureacrats (if indeed, they ever were): by almost any measure, pay-performance sensitivities have increased dramatically through the growing use of equity-based compensation.

In contrast, our results here suggest that European CEOs – excluding those in the UK – are, indeed still paid like bureaucrats. On average, these CEOs:

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89 There is asymmetry in how cash bonuses and equity-based pay are treated in the USA: bonuses are reported in the year earned, while stock is reported in the year granted. For example, Goldman Sachs routinely pays a portion of bonuses in cash and a portion in stock and options. The cash portion of the bonus paid in early fiscal 2007 for fiscal 2006 performance would be recorded (per SEC rules) as 2006 compensation, while the stock and option portion of the same bonus would be treadted by the SEC as 2007 compensation.

90 Two notable exceptions is that the coefficients on the lagged shareholder return for Ireland and Spain was positive and significant than insignificant as reported in Table 3.7.

- receive most of their compensation in the form of base salaries;
- receive three-fourths of their compensation in salaries and bonuses, but bonuses do not appear to vary with shareholder return, accounting performance, or sales growth;
- receive less than 12% of their pay in the form of stock or options;
- hold relatively little stock relative to their cash compensation or firm value.

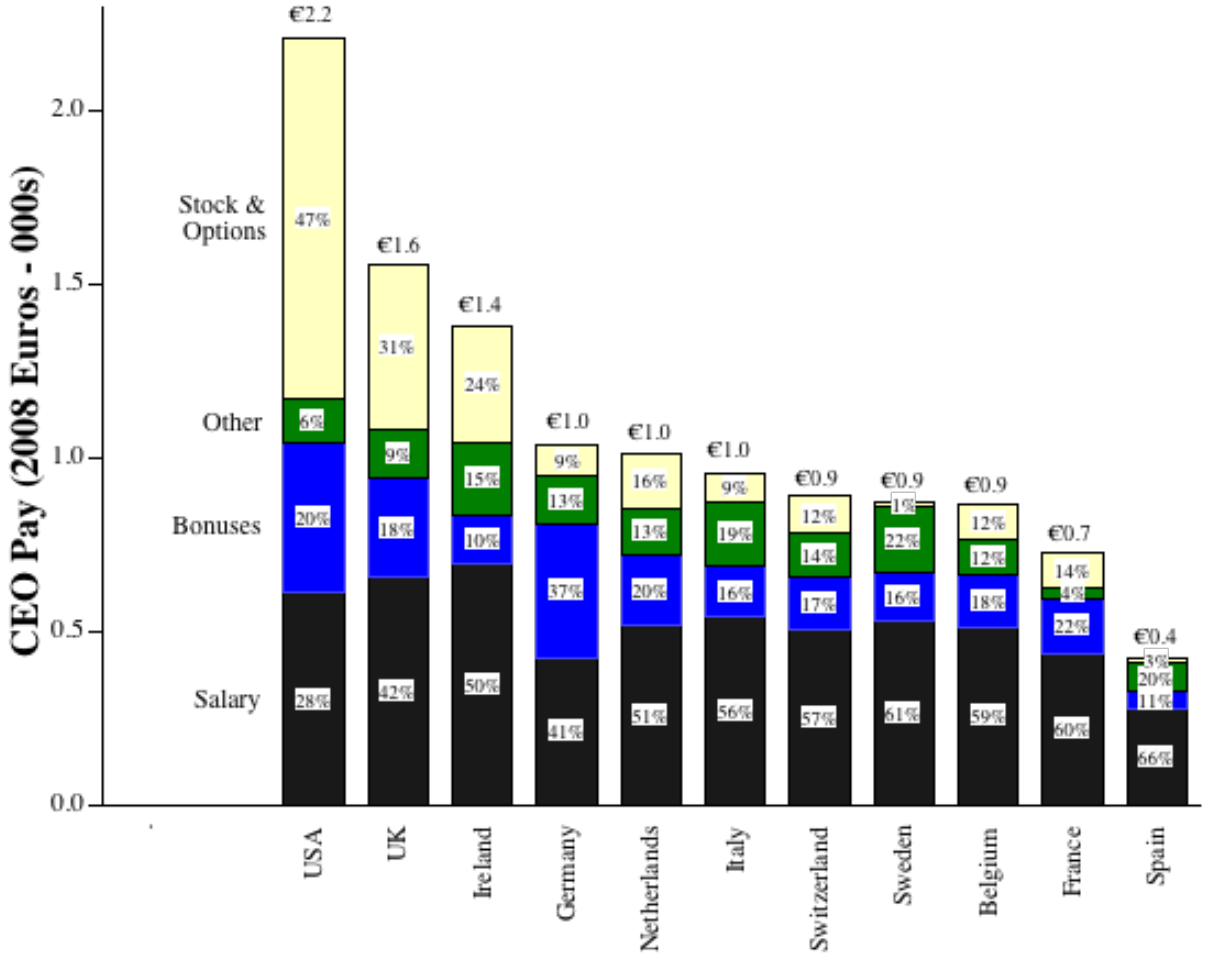
Overall, we find evidence of strong pay-performance sensitivities in the UK, although they still lag considerably behind their counterparts in the US. We also find some evidence that bonuses vary with performance for German CEOs. But, for the rest of Europe, we find no evidence that executives on average have incentives aligned with the interest of company shareholders.

3.3. The Transatlantic Pay Divide

Table 3.2 compared average and median pay for CEOs in the USA and the ten European countries without adjusting for company size or other factors that might effect competitive levels of pay across the two continents. In this Section, we will dissect the USA "Pay Premium" more carefully, analyzing time-trends and seeing how much of the observed premium can be explained by economic factors.

As a starting point, Figure 3.1 depicts the level and composition of total compensation for the USA and ten European countries after controlling for size and industry. In particular, the figure shows the compensation for a CEO in a manufacturing firm with €1 billion in revenues, estimated from the coefficients of a regression of ln(CEO Total Pay) on ln(Lagged Sales), five industry dummy variables, and dummy variables for each country. The pay composition percentages in the figure are constructed by first calculating the composition percentages for each CEO, and then averaging across all CEOs in each country. Countries in Figure 3.1 are sorted in descending order in terms of total estimated pay. The CEO of a USA manufacturing firm with €1 billion in prior-year sales is predicted to earn total compensation of €2.2 million annually in 2008, nearly 40% more than the next highest countries (UK and Ireland with expected pay levels of €1.6 million and €1.4 million, respectively), and more than double the predicted compensation for continental Europe. Estimated total pay levels for Germany, the Netherlands, Italy, Switzerland, Sweden, and Belgium are in a statistical dead-heat around €1 million, followed by France with €700,000 and Spain with a relative paltry €400,000.

Figure 3.1 2008 CEO Pay in the USA and 10 European Countries after controlling for Sales and Industry



Note: The figure compares 2008 CEO pay (in €mil) in each country controlling for firm size (sales) and industry. We regress the logarithm of total compensation on the logarithm of sales and 5 industry and 11 country dummies. For each country, we estimate the pay for a CEO running a hypothetical firm with $1 billion sales using the estimated coefficient for pay-size sensitivity and that country's dummy variable for a CEO in the largest industry group (manufacturing, energy, and utilities). Countries are sorted in descending order in terms of total estimated pay.

Table 3.8 explores time-trends in the USA Pay Premium from 2003 to 2008, based on regressions of Ln(CEO Pay) on prior-year Ln(Sales) and five industry dummies (the omitted category is manufacturing, energy, and utilities). The coefficient on the USA dummy of .7846 in 2003 indicates that, after controlling for company size and industry, USA CEOs earned about 119% more than their European counterparts in 2003.[91] The implied USA Pay Premium grew to 134% by 2005, fell to 75% in 2007, and grew to 102% in 2008 (when expected pay for manufacturing CEOs increased a bit in the USA, while falling in Europe).

[91] Since the dependent variable is in logarithms, the USA Pay Premium is calculated as $e^{.7846} - 1 = 1.192$.

Table 3.8 Regressions showing the time trend in the USA Pay Premium after adjusting for size and industry, 2003-2008

	Dependent Variable: Ln(CEO Total Compensation)					
Independent Variables	2003	2004	2005	2006	2007	2008
Intercept	3.960	4.257	4.262	4.208	4.5895	4.5498
USA (Dummy)	.7846 (4.4)	.8209 (4.1)	.8519 (4.0)	.6227 (3.4)	0.5608 (2.5)	0.7037 (4.4)
Ln(Lag Sales)	.3951 (9.6)	.3730 (12.8)	.3824 (15.1)	.4036 (12.6)	0.3630 (11.6)	0.3537 (15.4)
Consumer Goods	.0167 (0.3)	-.0479 (-1.5)	.0122 (0.3)	-.1016 (-2.8)	-0.1648 (-3.9)	-0.1520 (-2.7)
Hi-Tech Industry	.3187 (3.0)	.2146 (2.2)	.2204 (4.8)	.0908 (1.8)	-0.0367 (-0.9)	0.0483 (1.0)
Financial Services	.3404 (9.0)	.2307 (6.0)	.3358 (9.3)	.2737 (4.7)	0.0582 (1.3)	-0.0779 (-1.8)
Health Services	.5193 (6.8)	.4434 (3.7)	.3865 (4.2)	.3223 (5.6)	0.2368 (2.7)	0.2675 (2.8)
Other Industry	.0857 (1.8)	.0411 (0.8)	.1651 (2.5)	.0905 (1.9)	-0.0829 (-1.4)	-0.1258 (-2.3)
Implied USA Pay Premium	***119%***	***127%***	***134%***	***86%***	***75%***	***102%***
Sample Size	2615	2696	2824	2944	2838	2578
R^2	.4082	.3616	.3644	.3528	.2864	.2984

Note: t-statistics in parentheses, based on standard errors clustered at the country level.

Table 3.8 also suggests interesting (but not unexpected) time trends in the industry effects. In 2003, CEOs in financial services pooled across both continents earned 40% more than CEOs in manufacturing firms (the omitted category in the regression). The "finance premium" fell to 6% in 2007. In 2008, the year of the crash, the finance premium became a discount, as CEOs in financial services received 7.5% less in expected compensation than their counterparts in manufacturing firms. We will explore compensation practices within the financial services industry in more detail in Section 0.

In our study of 2006 CEO pay across 27 countries (Fernandes, Ferreira, Matos and Murphy (2009)), we find that at least some of the USA Pay Premium can be explained by controlling for firm and CEO characteristics beyond size and industry. In that spirit, Table 3.9 reports results from regressions with several additional control variables: Tobin's Q (the

ratio of market value to book value, often used to proxy for growth opportunities); Foreign Sales as a fraction of total sales (used as proxy for activity in the global product market); inclusion in the MSCI All-Country World Index (inclusion in the index increases global investments of the company stock); Institutional Ownership (separated into "domestic" or "foreign" ownership based on the location of the institutional investor); and dummy variables for whether the CEO also holds the position as chairman, is in his (or her) first year as CEO, and was hired from outside the firm (instead of being promoted from within).

As shown in column (1) of Table 3.9, CEO pay is significantly related to prior-year sales (as before), and also to foreign sales and domestic institutional ownership. CEO pay is also lower during a CEO's first year, plausibly reflecting partial-year pay for outside hires, and partial-year CEO-pay for inside promotions (who were presumably in a lower-paid position before their appointment). Most importantly for our purposes, including these additional control variables reduces the estimated 2008 USA Pay Premium from 102% (Table 3.8) to 56%.

Columns (2) and (3) of Table 3.9 present separate regressions for European and USA CEOs. While not informative about the USA Pay Premium per se, these regressions are informative about whether the determinants of pay vary across the two continents. Several differences emerge. First, 2008 CEO pay varies with Tobin's Q in Europe but not in the USA. Second, while CEO pay is significant *higher* for USA CEOs who also serve as board chairmen, pay is significantly *lower* for European CEOs serving in a dual capacity. In addition, while CEOs hired from the outside command a significant premium in the USA, there is no similar premium in Europe. Also, while CEOs serving in their first year receive lower pay in Europe, there is no pay difference in the USA for CEOs serving in their first year.

Table 3.9 Regressions of 2008 CEO Compensation on Firm and CEO Characteristics

	Dependent Variable: Ln(CEO Total Compensation)			
Independent Variables	(1)	(2) Europe	(3) USA	(4)
Intercept	4.813	4.856	5.105	4.896
USA (Dummy)	.4472 (4.4)	—	—	.1995 (3.2)
Ln(Lag Sales)	.2535 (11.4)	0.2413 (7.7)	0.2783 (12.4)	.2263 (10.9)
Tobin's Q (Mkt Value/Assets)	.1209 (1.6)	.2471 (2.9)	.0341** (1.2)	.0982 (3.1)
Foreign Sales as Fraction of Firm Sales	.3807 (4.6)	.4594 (4.8)	.2536** (2.6)	.2931 (3.5)
Firm in MSCI Index (Dummy)	.4668 (6.6)	.3362 (2.8)	.5008 (7.9)	.3280 (6.7)
Domestic Institutional Ownership	.4637 (6.9)	.3539 (2.0)	.5132 (3.8)	.1478 (2.0)
Foreign Institutional Ownership	.0655 (0.3)	.3968 (2.6)	-.6854*** (-2.2)	.0292 (0.2)
CEO is Chairman (Dummy)	-.0285 (-0.3)	-.2351 (-2.0)	.1245*** (2.6)	-.0075 (-0.1)
CEO in First Year (Dummy)	-.2396 (-1.9)	-.3739 (-3.3)	.0799*** (0.9)	-.3117 (-3.2)
CEO Hired Externally (Dummy)	.0926 (1.4)	.0119 (0.2)	.2129*** (3.8)	.0542 (1.0)
Equity Pay as Fraction of Total Pay	—	—	—	1.605 (25.2)
Industry Controls	Yes	Yes	Yes	Yes
Implied USA Pay Premium	***56%***	—	—	***22%***
Sample Size	2126	1072	1054	2126
R^2	.4721	.3569	.4300	.5962

Note: t-statistics in parentheses, based on standard errors clustered at the country level. Institutional ownership data from LionShares, and is defined as the institutional ownership by foreign (or domestic) institutions as a fraction of market capitalization.

,* indicates that the coefficient in the USA regression (4) is significantly different from the coefficient in the Europe regression (3) at the 5% and 1% levels, respectively.

Finally, columns (2) and (3) of Table 3.9 suggest interesting differences related to foreign sales and foreign ownership. In particular, the relation between pay and foreign sales is significantly stronger in Europe. In addition, while domestic institutional ownership is positively related to pay on both continents, foreign institutional ownership is positively related to pay in Europe and negatively related to pay in the USA. Although this issue warrants further investigation, we speculate that the "foreign sales" difference reflects European firms selling products in the USA, and the "foreign institutional ownership" in European firms reflects large USA investors. We suspect that European firms competing in the USA product market and capital market will tend to adopt more US-style compensation packages (with higher pay levels and more incentive-based pay). Similarly – although we do not currently have data – we suspect that CEOs in European firms with USA operations or subsidiaries will also tend to have more US-style pay packages.

The significant differences in the structure of pay between USA and European executives documented throughout this Section have important consequences for our interpretation of the USA Pay Premium. In particular, our measure of total compensation is meant to approximate the expected *opportunity cost* to shareholders of the CEO's pay package. However, as we discussed at length in Section 2.2.2, our measure does not approximate the value of the package from the perspective of a risk-averse and undiversified CEO who presumably does not hedge the risk of the package. All else equal, we expect that CEOs at companies with riskier pay will receive higher expected levels of pay to compensate for the increased risk. Moreover, we expect less-diversified CEOs (i.e., those with more of their wealth tied up in their company's stock) to demand even higher risk premiums. Therefore, it is plausible that at least some (if not all) of the observed USA Pay Premium reflects a risk premium for both incentive compensation (Table 3.2) and lack of diversification (Table 3.6).

Following Fernandes, Ferreira, Matos and Murphy (2009), Column (4) of Table 3.9 replicates column (1) after including an additional explanatory variable – equity-based pay as a fraction of total pay – to control for the composition of the pay package. The coefficient on this variable is positive and highly significant (t=25.2), indicating that CEOs receiving more of their compensation in the form of stock and options receive higher levels of expected compensation. Moreover, control for the structure of pay reduces the USA Pay Premium from 56% (column (1)) to 22%. Therefore, the results suggest that much of the observed pay differences between USA and European executives reflect differences in the composition of pay.

One on hand, our results are intuitive: we know that stock and options are riskier than salaries (and likely riskier than bonuses), and it is inappropriate to simply add the different forms of compensation to get a measure of total compensation without regard to risk. We also know that executives value stock and options much less than their expected value, suggesting that stock and options should be weighted less than salaries in constructing a measure of the value of total compensation from the perspective of a risk-averse executive. On the other hand, including the ratio of equity pay to total pay as an explanatory variable is at best a crude way to control for the riskiness of the pay package. Moreover, under plausible situations, this ratio may vary mechanically with total compensation for reasons having nothing to do with risk.[92]

Conceptually, a better way to evaluate whether risk and pay-composition issues explain the USA Pay Premium is to compute "certainty equivalent" measures of total compensation as outlined in Section 2.2.2. Constructing these measures require detailed data on stock and option holdings, and require assumptions about executive risk aversion, outside wealth and trading behavior (e.g., whether the executive adjusts his current portfolio after receiving more options, and whether he sells shares acquired through option exercises immediately after exercise). In the spirit of this approach, Conyon, Core and Guay (2009) show that, for a reasonable range of parameters, the risk-adjusted pay for USA CEOs is not dramatically higher than the risk-adjusted pay for UK CEOs.

3.4. Equity-based Incentives for European CEOs

Our finding that the observed USA Pay Premium is in part "explained" by the fact that USA CEOs have different pay structures merely shifts the question: Why do American executives USA receive more incentive compensation (and particularly more equity-based compensation) than do European executives?

Indeed, while equity-based compensation (and especially stock options) has been a staple of USA compensation contracts for more than a half-century, the use of equity-based pay in most of Europe is a relatively recent phenomenon. Table 3.10 shows how the importance of equity-based pay has changed over time in the United States and in nine European countries using Towers Perrin's *Worldwide Total Remuneration* (WWTR) surveys

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92 For example, suppose that compensation consists solely of base salaries and stock, and that base salaries are implicitly capped, either through tax policies (Section 2.4.3) or Bebchuk-Fried "outrage" considerations (Section 2.5.1). In this case, note that Total Pay = (Capped Salary)/(1 - Ratio of Equity/Total Pay); total pay is perfectly predicted by the ratio of equity to total pay.

Table 3.10 Stock-Based Pay (as a Percentage of Total Pay) in Europe and the US, based on Towers Perrin consultant surveys 1984 - 2003

	1984	1988	1992	1996	1999	2001	2003
Belgium	0.0%	0.0%	0.0%	0.0%	3.2%	11.6%	11.2%
France	12.3%	13.3%	15.6%	14.6%	14.3%	15.1%	16.0%
Germany	0.0%	0.0%	0.0%	0.0%	9.7%	13.5%	18.0%
Italy	0.0%	0.0%	0.5%	4.0%	9.1%	17.2%	15.1%
Netherlands	0.0%	0.0%	0.0%	0.0%	14.6%	16.7%	15.8%
Spain	0.0%	0.0%	0.0%	0.0%	16.0%	17.9%	19.2%
Sweden	0.0%	0.0%	0.0%	0.0%	6.8%	11.0%	10.7%
Switzerland	1.9%	1.9%	3.4%	3.6%	1.8%	0.0%	19.2%
United Kingdom	14.5%	14.6%	15.7%	15.0%	16.6%	19.1%	20.8%
United States	16.9%	28.3%	32.3%	28.7%	25.5%	44.8%	48.3%

Note: Data from Perrin's *Worldwide Total Remuneration* reports (various issues), including 1984-1992 data reported by Abowd and Kaplan (1999). Data reflects Towers Perrin's estimate of competitive CEO pay for industrial companies with approximately US $300 million in annual revenues. Stock-based pay includes the grant-date expected value of option grants and annualized targets from performance share plans.

for the selected years 1984, 1988, 1992, 1996, 1999, 2001, and 2003. The data for the years 1992 to 1996 are based on the Abowd and Kaplan (1999) analysis of the WWTR surveys. As shown in Table 3.10, only France and the UK made extensive use of stock or options in the 1980s, and equity-based pay did not become common across Europe until the end of the 1990s. By 2003, Towers Perrin reports that equity-based pay accounts for between 10% and 20% of competitive pay for European CEOs, and for about half of pay for American CEOs.

As we discussed above in Section 3.2, the percentages in Table 3.10 are not based on "data" per se, but rather depict the consulting company's estimates of "typical" or "competitive" pay for a representative CEO in an industrial company with an assumed amount in annual revenues, based on questionnaires sent to consultants in each country. In Table 3.11, we provide our own estimates of equity-based pay for 2003-2008 based on actual grant-date values extracted from BoardEx (for Europe) and ExecuComp (for the USA). The actual averages for 2003 in Table 3.11 are generally consistent with the consultant surveys in Table 3.10 for the same year, increasing our confidence in both data sources.

As shown in Table 3.11, the use of equity-based compensation has generally declined in continental Europe between 2003 and 2008, and has remained relatively constant in the

Table 3.11 Stock-Based Pay (as a Percentage of Total Pay) in Europe and the US, based on grant-date values, 2003-2008

	2003	2004	2005	2006	2007	2008
Belgium	na	16.7%	8.6%	9.5%	7.7%	11.5%
France	17.6%	15.9%	16.0%	17.2%	17.8%	13.9%
Germany	12.5%	8.7%	9.4%	9.3%	9.4%	9.0%
Italy	11.5%	10.6%	15.7%	13.1%	5.7%	8.6%
Netherlands	19.3%	16.3%	20.1%	21.7%	18.2%	15.8%
Spain	0.0%	1.2%	0.0%	0.8%	5.3%	2.9%
Sweden	3.7%	1.3%	1.5%	1.8%	1.5%	1.3%
Switzerland	30.2%	21.5%	20.1%	26.6%	17.1%	12.0%
United Kingdom	27.7%	27.7%	29.7%	31.0%	34.1%	30.6%
United States	40.7%	42.0%	41.4%	39.5%	43.0%	47.1%

Note: Data from BoardEx and ExecuComp. The percentages in the table are constructed by first computing the average ratio of equity-based pay to total compensation for each CEO, and then averaging across CEOs.

UK at just under a third of total compensation. In contrast, the use of equity-based pay in the USA has increased from 40.7% of total pay in 2003 to nearly half of total pay in 2008.[93]

Traditional agency theory suggests a finite number of factors that might explain higher pay and incentives among USA executives. First, American CEOs may be less risk averse or have steeper marginal costs of effort than their European counterparts, but to our knowledge there is no theory or empirical work suggesting such international differences in risk-aversion coefficients. Second, European performance might be measured with substantially more noise than in the USA, leading to lower pay-performance sensitivities and lower expected levels of pay. However, we find no evidence that cash flows or shareholder returns are systematically more variable in Europe than in the USA. Extensions of the traditional model to incorporate differences in both ability and in the marginal productivity of CEO effort might help reconcile the data, but only given the additional assumptions that executives are

[93] The percentages for USA CEOs are substantially smaller than those reported in Figure 2.3, since the former are based on a broad sample of S&P 500, S&P MidCap 400, and S&P SmallCap 600 firms, while the latter are based only on S&P 500 CEOs. As we saw in Table 3.4, equity-based pay (as a percentage of total pay) increases with company size.

more able and more productive in the USA. Overall, there are no compelling agency-theoretic explanations for the relative reliance on equity-based compensation in the USA.[94]

Our analysis in Section 2.4 offers non-theoretic explanations for the evolution of equity-based pay in the USA. In particular, we showed that America's reliance on stock options as the primary form of long-term compensation began in the 1950s as a result of tax policies designed to promote options, and declined in the late 1960s when the government reduced the tax benefits. The use of options stayed relatively modest during the 1970s stagnation, and began growing in the mid-1980s, buoyed by the fact that companies could grant options without incurring an expense on their accounting statements. The early 1990s created a "perfect storm" for an explosion of option grants for not only executives but lower-level managers and employees. First (applying only to the top executives), options were considered a "safe-harbor" from the government's $1 million cap on deductible compensation. Second, after years of speculation that companies would need to begin expensing their options on accounting statements, FASB reverted to the old accounting rules. Third, government policies and stock-exchange listing rules promoted broad-based grants. The explosion in option grants continued unabated until the burst of the Internet bubble in 2000, followed by a series of accounting scandals that re-focused attention on the accounting treatment of options. Eventually, FASB mandated expensing, and companies moved away from options towards restricted stock.

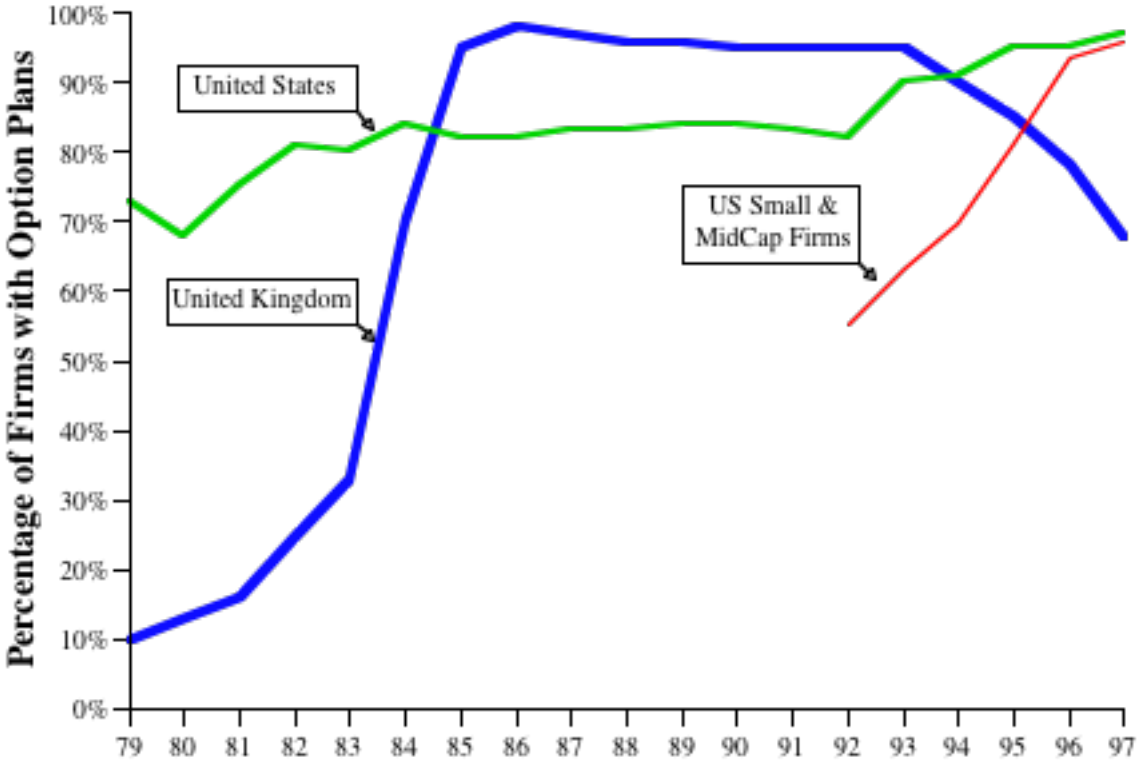
To the extent that the USA experience has reflected USA-specific tax, accounting, disclosure, and social policies (coupled with Congressional knee-jerk reactions to isolated scandals), there is no reason a priori to expect that other countries with different regulatory environments will have similar experiences. In the remainder of this Section, we conduct a parallel analysis of the evolution of equity-based compensation in Europe, focusing primarily on the UK, France, and Germany. We show how compensation practices in each country largely reflect country-specific experiences. At the same time, competition for American consumers, investors, and managers have forced (or allowed?) European companies to move gradually towards USA-style incentives.

3.4.1. United Kingdom

Figure 3.2 compares the prevalence of stock option plans in the UK and USA from 1979 to 1997. The UK data are from Main (1999) and are based on data provided by a large

[94] Indeed, as documented by Yermack (1995), agency-theoretic variables have little explanatory value in predicting the use of equity-based compensation in a cross-section of USA publicly traded firms.

Figure 3.2 Prevalence of Stock Option Plans in the UK and USA, 1979 - 1997



Note: UK data from Main (1999). US data 1979-1996 from the Conference Board "Top Executive Compensation" reports (various issues). US data for 1997 include percentage of S&P 500 companies that have executives holding options (these data closely track the Conference Board data from 1992-1996). US Small and MidCap data include percentage of companies in the S&P MidCap 400 and SmallCap 600 that have executives holding options.

compensation consulting firm. The US data for 1979-1996 are from the Conference Board "Top Executive Compensation" reports, which cover predominately S&P 500 companies.[95] The data for "US Small and MidCap" firms are extracted from ExecuComp, and defined as the fraction of MidCap and SmallCap companies in which the top five executives hold any options during the year. As shown in the figure, options grants in the UK grew dramatically in popularity from the mid-1980s to the early-1990s. In particular, in 1978 only 10% of UK companies offered options to their top executives, by 1983 over 30% of companies offered options.

The rise in UK option grants beginning in the early 1980s can be traced, in part, to UK tax policies designed to encourage stock option grants to large numbers of UK employees. In particular, the 1980s Finance Act created a new type of option scheme where employees

[95] The Conference Board discontinued their plan-prevalence data series in 1997. For this year, we use ExecuComp data on the fraction of S&P 500 companies in which the top five executives hold any share options. This definition of prevalence closely tracks the Conference Board's survey responses for the 1992-1996 period where both sources of prevalence data are available.

investing their savings in company stock options could escape all taxes upon exercise, provided that they held the option for a sufficient period of time.[96] The new options had a term of either five or seven years, and would be granted at a fixed exercise price no less than 90% of the grant-date market price. In 1983, the government created a second type of tax-favored option plan, called the "Save As You Earn (SAYE) Share Option Issue Series B."[97] In 1984, the government doubled the monthly limit on savings under the plan (from £50 to £100). In April 1984, in a move reminiscent of the US policies in 1950, the UK government extended benefits to top executives receiving options, by designating gains upon exercising options as "capital gains" taxable only when the shares were ultimately sold rather than as ordinary income taxable upon exercise.[98]

In 1979, only three UK firms offered options to all employees. By 1982 more than 200 companies were offering such plans, and by 1984 nearly 700 companies offered broad-based government-approved (and encouraged) option plans.[99] As shown in Figure 3.2, by 1986 – following the new tax treatment for options granted to top executives – nearly all UK companies offered option plans to its executives (and often to all employees). Indeed, as shown in the figure, from 1985 to 1993 the prevalence of options in the UK surpassed the prevalence in the USA.

As discussed in Section 3.1, stock options became controversial in the UK in the early 1990s after executives in water, gas, and electric utilities began reporting gains on options granted when the utilities were privatized in 1990. The exercise prices had been set at the government's assumption of a market price, which turned out to be much lower than the actual price the shares would sell for on the open market. As a result, the executives realized large option gains even as their companies underperformed their industry. The outrage over these option schemes led to the influential report by the Greenbury (1995) committee, which called for a comprehensive review (with potential retroactive changes) of all option plans at existing privatized utilities, and a moratorium on granting options at newly privatized utilities until six months after the shares are traded on open exchanges. More broadly, the Greenbury

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96 See Anthony, "Changes to encourage share-holding," *Guardian* (May 17, 1980), p. 20; Moullin, "Better schemes now for profit-sharing," *Guardian* (August 16, 1980), p. 18; Davis, "Cheap Shares," *Observer* (October 24, 1982), p. 23.

97 Dibben, "Opening up the options," *Guardian* (November 19, 1983), p. 23.

98 "Share Options: Employees shares fillip," *Guardian* (March 14, 1984), p. 3.

99 Davis, "Cheap Shares," *Observer* (October 24, 1982), p. 23; "Share Options: Employees shares fillip," *Guardian* (March 14, 1984), p. 3.

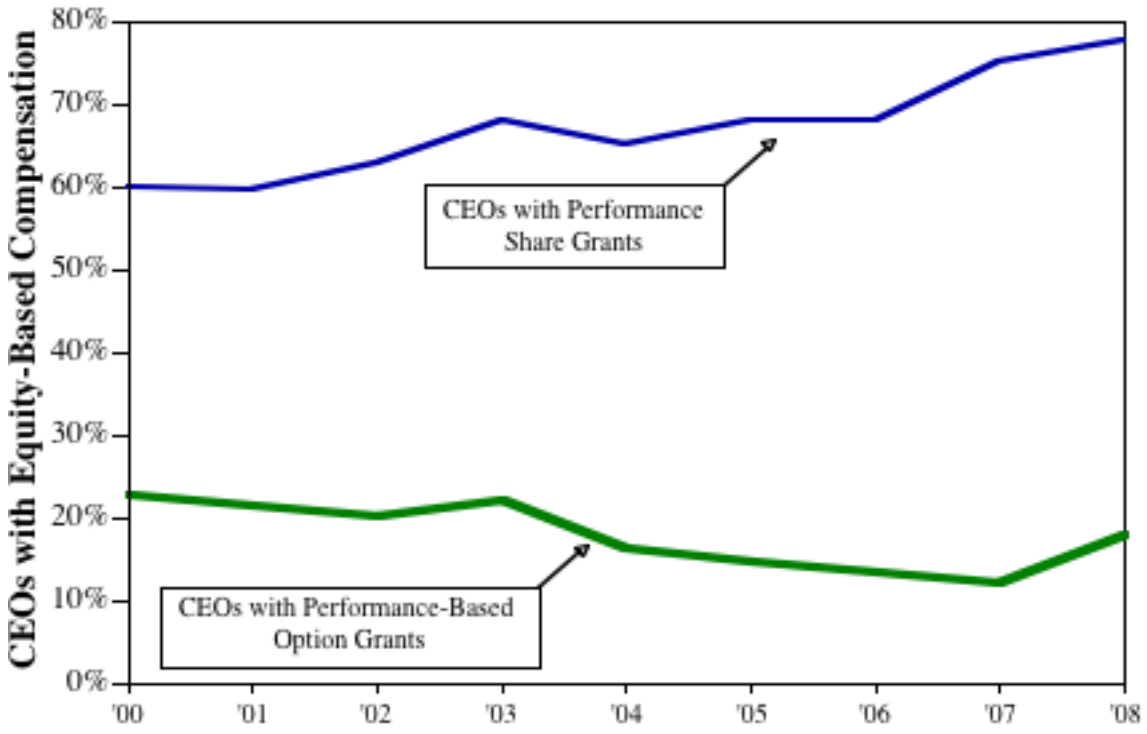
committee made several recommendations regarding option plans applicable to all publicly traded UK companies:

- Executive options should be taxed as ordinary income upon exercised, and not as capital gains when the stock is eventually sold.
- All options should be subject to a "challenging performance criteria" so that the option cannot be exercised unless the criteria are met. Executives should not be rewarded for increases in share prices or other indicators which reflect general price inflation, general movements in the stock market, or movements in a particular sector of the market.
- As a preferable alternative to stock options, companies should consider performance share plans, in which shares are awarded if "challenging performance criteria" are fulfilled, provided that the executives hold the shares for a substantial period.

In response to the Greenbury report and the ongoing controversy, the government tightened the restrictions on approved option awards (i.e., those treated as capital gains rather than ordinary income), reducing the amount that could be awarded to executives (expressed as the aggregate exercise price) from the greater of £100,000 or four times cash emoluments to only £30,000. In addition, the influential Association of British Insurers (ABI) issued guidelines effectively constraining the issuing of options – approved and unapproved – to four times cash compensation.[100]

[100] See, for example, Association of British Insurers (1994); Association of British Insurers (1995).

Figure 3.3 CEOs in UK Firms receiving equity-based compensation, 2000-2008



Note: Sample is based on BoardEx data and include UK CEOs in firms with revenues exceeding €100 million.

While the Greenbury report was not legally binding, most UK firms complied with its recommendations within a few years after its release. As a result, stock options granted in the UK since Greenbury typically vest only upon attainment of some performance criteria, often based on earnings-per-share growth. In addition, many companies replaced their option plans with performance share plans (or added performance share plans on top of option plans). Figure 3.3 shows the percentage of UK companies that made performance option or performance share grants to their CEOs between 2000 and 2008. In 2000, 23% of UK companies offered performance-vesting stock options to their executives (constituting 3% of pay for the average CEO), while 60% offered performance shares (constituting 23% of pay on average). By 2000, only 18% of the companies offered options (constituting only 1.3% of pay), while nearly 80% offered performance shares (averaging 30% of pay).

Juxtaposing the USA and UK cases yields an interesting lesson in path dependence, showing how small differences in events can lead to large differences in outcomes. CEO pay became highly controversial in both the USA and UK at about the same time (i.e., in the early 1990s). Both controversies largely focused on gains realized from stock options at a time when the general economy was poor and company layoffs were prevalent. The UK controversy had the added (and important) element that key source of the outrage focused on

executives in recently privatized utilities. Both controversies led to calls for increased compensation disclosure, especially with respect to stock option plans.

In the USA, the controversy culminated with the passage of IRS Section 162(m), that imposed a $1 million cap on the deductibility of executive compensation, unless that compensation was performance-based. Though the explicit intent of Section 162(m) was to reduce levels of pay, it had the opposite effect by fueling the explosion in stock option grants throughout corporate USA. In contrast, the UK the controversy culminated with the widespread adoption of the Greenbury recommendations, which demanded that options have performance-vesting provisions and encouraged the use of performance shares over options.

In a sense, the USA has recently moved closer to the UK with the increasingly importance of restricted stock over traditional stock options: perhaps Figure 2.10 (showing time trends in restricted stock vs. options in the USA) will soon converge to Figure 3.3). However, in contrast to the performance vesting of shares and options in the UK, the vesting and exercisability of almost all USA stock and options is triggered solely by the passage of time and not by meeting performance criteria.

3.4.2. France

The concept of stock options was introduced in France as long ago as 1967, despite President Charles de Gaulle's suspicions of anything emanating from the USA.[101] France formally made executive stock options legal in 1970 but, due in part to the stagnant stock market of the 1970s and the high marginal tax rate on option exercises, the first executive option plan was not created until 1984.[102] In that year, the (interestingly) socialist French government passed a rule taxing options as capital gains (at a top rate of 19.4%) rather than as ordinary income (at a top rate of 60%), greatly increasing their attractiveness.[103] As a result of these new incentives, the use of stock options in France quickly approached their use in the UK (see Table 3.10).

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[101] Graham, "The soft option - The compromise reached over the taxing of executive share," *Financial Times* (April 28, 2000b), p. 18.

[102] Delaney and Wessel, "Lumpy Gravy: Suppose Stock Options Involved More Pain Than Financial Gain --- That's the Case in Europe, Which Helps to Explain High-Tech Lag There --- `A Bit Perverted' in France," *Wall Street Journal* (December 21, 1999a), p. A1.

[103] Ricklefs, "Changing Course: French Voters Prod Socialist Leadership To Veer Right Sharply --- Government Reduces Taxes, Advocates Stock Options; Impetus: Unemployment --- Virtues of Private Enterprise," *Wall Street Journal* (September 26, 1984).

Stock options for French CEOs came under attack in the early 1990s, as executives began exercising options granted under the tax rules passed in 1984.[104] In May 1995, a Senate Commission proposed sweeping new disclosure rules for stock options that would require firms (for the first time) to report detailed information on option grants, and would also prohibit grants made prior to favorable information disclosures.[105]

3.4.3. Germany

More to come.

3.4.4. Italy

Stock option plans in Italy existed before 1990, but were mainly limited to subsidiaries of multinational companies (Marchettini (2001)). Prior to 1998, executives exercising options were subject to employment income tax and both the executive and employer were subject to social insurance tax. Under new tax policies effective in July 1998, stock options plans using newly issued shares were no longer considered taxable income (and were taxed at a lowered 12.5% capital gains rate). At about the same time, corporate-governance rules approved by the Italian government made it easier for companies to launch capital increases needed for stock-option programs.[106] As a result of these two changes, the use of options escalated, and by the end of 1998, half of all companies on the Milan Stock Exchange were either using or planning to introduce stock-option plans (Brunello, Graziano and Parigi (2001)).

In January 2000, the Italian government new policies to both curb perceived abuses under the current system (in which some executives had received highly discounted options) and to further encourage stock option grants, especially those to lower-level employees.[107] First, the new rules provided an exemption from income tax and social insurance on the spread at exercise up to a threshold of €2,065 per employee per year, as long as the options were offered to all employees, and the shares were not sold for three years after exercise. Second, the new rules provided for capital gain treatment for all options (and not only those

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[104] Jack, "France to Reform Stock Options," *Financial Times* (December 22, 1994), p. 2.

[105] Jack, "Paris Urges Share Option Reform," *Financial Times* (May 17, 1995), p. 2.

[106] O'Brian, "Italian Companies Begin to Provide Stock Options, Details of Financial Data," *Wall Street Journal* (May 29, 1998); "Italy's Compart To Offer Execs Stock Options; Joins Trend," *Dow Jones International News* (March 16, 1998).

[107] Salvatore, "Taxation Of Stock Options - A Summary Of Latest Developments - Graham & James," *Mondaq Business Briefing* (March 1, 2000); Werdel and Diamond, "Navigating stock options in Europe," *Workspan* (August 1, 2002), p. 28.

issued from newly issued shares), provided that the recipient held less than 10% of the outstanding shares and that the exercise price of the option was at least the grant-date fair market value.[108]

Stock options became modestly controversial in Italy 2001 after revelations that Gucci top executives could make more that €440 million from exercising options in connection with an acquisition by Pinault-Printemps-Redoute; the rival bidder (Moet-Hennessy Louis Vuitton) described the payments as "monstrously disproportionate."[109] But, for the most part, limited disclosure of executive pay practice and option exercises muted public controversy. However, in late 2006, the government added restrictions to the favorable tax treatment, requiring that options must not be exercisable for at least three years after grant, and requiring that executives exercising options hold a portion of the acquired shares for at least five years after exercise.[110] As shown in Table 3.11, the use of equity-based pay in Italy dropped immediately and significantly after these new requirements.

In August 2008, the Italian government formally eliminated the tax advantages for stock options, requiring all options to be taxed as ordinary income upon exercise. However, a last-minute amendment to the decree allowed option exercises to continue to be exempt from social insurance taxes, provided that the executives comply with the five-year holding period.

3.4.5. The Rest of Europe

More to come.

4. Pay, Politics, and the Financial Crisis

4.1. The USA Experience

While controversies over executive compensation have erupted on occasion for decades, the eruptions reached Mt. Vesuvius levels in the midst of the financial crisis. In the USA, the first flash point came in early 2009 when it was revealed the Merrill Lynch had

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[108] As defined under Italian law, the "fair market value" is the average of the closing prices of the company shares on the relevant stock exchange for each trading day during the month preceding the grant date.

[109] Johnson, "Gucci chiefs may net $390m," *Financial Times* (November 2001, 2001).

[110] The executive was allowed to sell enough shares to pay the exercise price. See Marshall, "Loss Of Tax Exemption For Italian Stock Options Has A Silver Lining," *Mondaq Business Briefing* (September 19, 2008).

paid bonuses of $1 million (€720,000) or more apiece to nearly 700 employees just ahead of its acquisition by Bank of America.[111] By 2004, Merrill had become the leading underwriter of mortgage-based collateralized debt obligations (CDOs), and held on to a substantial portion of its own CDOs as an investment. When the mortgage market collapsed, so did the value of the CDOs: between July 2007 and July 2008 Merrill lost nearly €14 billion, or about €38 million daily.[112] Fearing Merrill's imminent failure, the USA Treasury and Federal Reserve hastily arranged a €36 billion shotgun wedding between Merrill and Bank of America. When Bank of America took the proposed merger agreement to a shareholder vote, it assured shareholders that Merrill could not pay any bonuses without express written consent from Bank of America. What the bank failed to tell shareholders is that it had *already* given Merrill written consent to pay up to €4.2 billion in discretionary year-end bonuses.

In December 2009, just before the completion of the merger, Merrill distributed €2.6 billion in bonuses to its 36,000 employees; the top 14 bonus recipients received a combined €180 million, while the top 149 received €616 million (Cuomo (2009)). The CEOs of Bank of America and the former Merrill Lynch (neither of whom received a bonus for 2008) were quickly hauled before Congressional panels outraged by the payments, and the Attorney General of New York launched an investigation to determine if shareholders voting on the merger were misled about both the bonuses and Merrill's true financial condition. The SEC joined in with its own civil complaint which sued the Bank of America but not its individual executives, and the bank agreed to settle for €24 million. However, a few weeks later a federal judge threw out the proposed settlement, insisting that individual executives be charged and claiming that the settlement did "not comport with the most elementary notions of justice and morality."[113] In February 2010, the judge relented and approved the settlement after it had been increased to over €100 million.

The original USA bailout bill establishing the "Troubled Asset Relief Program" ("TARP") was enacted as part of the "Emergency Economic Stabilization Act" ("ESSA") in October 2008 and included what at the time seemed like serious restrictions on executive pay. For example, while Section 304 of the 2002 Sarbanes-Oxley Act required "clawbacks" of certain executive ill-gotten incentive payments, the Act only covered the CEO and chief

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[111] Bray, "Crisis on Wall Street: Merrill Gave $1 Million Each to 700 Of Its Staff," *Wall Street Journal* (February 12, 2009), p. C3.

[112] Story, "Chief Struggles to Revive Merrill Lynch," *New York Times* (July 18, 2008).

[113] Scannell, et al., "Judge Tosses Out Bonus Deal --- SEC Pact With BofA Over Merrill Is Slammed; New York Weighs Charges Against Lewis," *Wall Street Journal* (September 15, 2009), p. A1.

financial officer (CFO), and only covered accounting restatements. While applying only to TARP recipients (Sarbanes-Oxley applied to all firms), the October 2008 ESSA covered the top-five executives (and not just the CEO and CFO), and covered a much broader set of material inaccuracies in performance metrics. In addition, ESSA lowered the cap on deductibility for the top-five executives from $1 million to $500,000, and applied this limit to all forms of compensation (and not just non-performance-based pay). ESSA also prohibited new severance agreements for the top five executives, and limited payments under existing plans to 300% of the executives' average taxable compensation over the prior five years. When Treasury invited (or, in some cases, coerced) the first eight banks to participate in TARP, a critical hurdle involved getting the CEOs and other top executives to waive their rights under their existing compensation plans.

By the time the Merrill Lynch bonuses were revealed, the USA had a new President, a new administration, and new political resolve to punish the executives in the companies perceived to be responsible for the global meltdown. In mid-February 2009, separate bills proposing amendments to ESSA had been passed by both the House and Senate, and it was up to a small "conference" committee to propose a compromise set of amendments that could be passed in both chambers. On 13 February – as a last-minute addition to the amendments – the conference chairman (Senator Chris Dodd) inserted a new section imposing restrictions on executive compensation that were opposed by the Obama administration and draconian even relative to the limitations in the October 2008 version. Nonetheless, the compromise was quickly passed in both chambers with little debate and signed into law by President Obama on 17 February 2009.

While the "clawback" provisions under the original ESSA covered only the top five executives (up from only two in SOX), the "Dodd Amendments" extended these provisions to 25 executives and applied them retroactively.[114] In addition, while the original ESSA disallowed severance payments in excess of 300% of base pay for the top five executives, the Dodd Amendments covered the top 10 executives and disallowed *all* payments (not just those exceeding 300% of base). The Dodd Amendments also retroactively extended the deductibility restrictions to the top 25 executives (and not just the top 5). Most importantly, the Dodd Amendments allowed only two types of compensation: base salaries (which were

[114] The number of executives covered by the Dodd Amendments varied by the size of the TARP bailout, with the maximum number effective for TARP investments exceeding US$500 million. As a point of reference, the average TARP firm among the original eight recipient received an average of US$20 *billion* in funding, and virtually all the outrage over banking bonuses have involved banks taking well over US$500 million in government funds. Therefore, we report results assuming that firms are in the top group of recipients.

not restricted in magnitude), and restricted stock (limited to grant-date values no more than half of base salaries). The forms of compensation explicitly prohibited under the Dodd amendments for TARP recipients include performance-based bonuses, retention bonuses, signing bonuses, severance pay, and all forms of stock options.

As draconian as the Dodd Amendments (triggered by the Merrill Lynch payments) were, things were about to get worse. The second flash point for outrage over bonuses involved insurance giant American International Group (AIG), which had received over €125 billion in government bailout funds, in large part to offset over €40 billion in credit default-swap losses from its Financial Products unit. In March 2009, AIG reported it was about to pay €121 million as the second installment of €320 million in contractually obligated "retention bonuses" to employees in the troubled unit. (The public outrage intensified after revelations that most of AIG's bailout money had gone directly to its trading partners, including Goldman Sachs (€9.3 billion), Germany's Deutsche Bank (€8.6 billion), and France's Societe Generale (€8.3 billion).) The political fallout was swift and furious: in the week following the revelations seven bills were introduced in the House and Senate aimed specifically at bonuses paid by AIG and other firms bailed out through Treasury's Troubled Asset Relief Program ("TARP"):

- H.R. 1518, the "Bailout Bonus Tax Bracket Act of 2009" imposed a 100% tax on bonuses over $100,000.

- H.R. 1527 imposed an additional 60% tax (on top of 35% ordinary income tax) on bonuses exceeding $100,000 paid to "employees of businesses in which the federal government has an ownership interest of 79% or more." (Not coincidentally, the government owned 80% of AIG when the bill was introduced.)

- H.R. 1575, the "End Government Reimbursement of Excessive Executive Disbursements Act" (i.e., the "End GREED Act") authorized the Attorney General to seek recovery of and limit excessive compensation.

- H.R. 1577, the "AIG Bonus Payment Bill" required the Secretary of Treasury to implement a plan within two weeks to thwart the payment of the AIG bonuses, and required Treasury approval of any future bonuses by any TARP recipient.

- H.R. 1586 sought to impose a 90% income tax on bonuses paid by TARP recipients; employees would be exempt from the tax if they returned the bonus in the year received.

- S. 651, the "Compensation Fairness Act of 2009," imposed a 70% excise tax (half paid by the employee and half by the employer) for any bonus over $50,000 paid by a TARP firm.

- H.R. 1664, the "Pay for Performance Act of 2009" prohibited any compensation payment (under existing as well as new plans) if such compensation: (1) is deemed "unreasonable or excessive" by the Secretary of the Treasury; and (2) includes bonuses or retention payments not directly based on approved performance measures. The bill also created a Commission on Executive Compensation to study and report to the President and Congress on the compensation arrangements at TARP firms.

Most of these bills (H.R. 1518, 1527, 1575, 1577 and S. 651) were either stalled in committees or failed in a vote. However, H.R. 1586 and H.R. 1664 (the Pay for Performance Act of 2009) were passed by the House and sent to the Senate. H.R. 1586 was ultimately passed after being stripped of the executive-compensation provisions, while H.R. 1664 is still awaiting Senate attention.[115]

While details on the compensation of the five highest-paid executive officers are publicly disclosed and widely available, banks have historically been highly secretive about the magnitude and distribution of bonuses for its traders and investment bankers. Indeed, since the SEC disclosure rules only apply to *executive officers*, the banks can have non-officer employees making significantly more than the highest-paid officers. Following the Merrill Lynch and AIG revelations, New York Attorney General Andrew Cuomo subpoenaed bonus records from the nine original TARP recipients, arguing that New York law allows creditors to challenge any payment by a company if the company did not get adequate value in return. His report – published in late July 2009 – was provocatively titled: "No Rhyme or Reason: The 'Heads I Win, Tails You Lose' Bank Bonus Culture."

Table 4.1 summarizes the distribution of bonuses for the nine original TARP recipients, based on data from the Cuomo (2009) report. The table shows, for example, that 738 Citigroup employees received bonuses over US$1 million (€720,000), and 124 received over US$3 million (€2.15 million), in a year when the bank lost €20 billion. The 2008 bonus pools exceeded annual earnings in six of the nine banks; in aggregate the banks paid €22.8 billion in bonuses while losing €58.5 billion in earnings. Not surprising, the Cuomo report further fueled outrage over Wall Street bonuses on both Main Street and in Washington.

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[115] Without trying to explain (because it is beyond our comprehension), H.R. 1586 was ultimately passed and signed into law as the "FAA Air Transportation Modernization and Safety Improvement Act," stripped of any mention of executive bonuses and TARP recipients.

Table 4.1 2008 Earnings and Bonus Pools for Eight Original TARP Recipients

Corporation	2008 Earnings/ *(Losses)* (€bil)	2008 Bonus Pool (€bil)	Number of Employees Receiving Bonuses Exceeding		
			$3 mil (€2.2mil)	$2 mil (€1.4mil)	$1 mil (€.7mil)
Bank of America	€2.9	€2.4	28	65	172
Bank of New York Mellon	€1.0	€0.7	12	22	74
Citigroup	*(€20.0)*	€2.9	124	176	738
Goldman Sachs	€1.7	€3.8	212	391	953
J P Morgan Chase	€4.0	€6.2	>200		1,626
Merrill Lynch	*(€19.8)*	€2.6	149		696
Morgan Stanley	€1.2	€3.2	101	189	428
State Street Corp	€1.3	€0.3	3	8	44
Wells Fargo & Co.	*(€30.8)*	€0.7	7	22	62

Source: Cuomo (2009). Wells Fargo's losses include losses from Wachovia (acquired in December 2008).

The Dodd Amendments were signed into law with the understanding that the USA Treasury would work out the implementation details. In June 2009, Treasury issued its rulings, along with the simultaneous creation of the Office of the Special Master of Executive Compensation. The Special Master (or "Pay Czar") had wide-ranging authority over all TARP recipients, but was particularly responsible for all compensation paid to the top 25 executives in the seven firms deemed to have required "special assistance" from the USA government: Bank of America, Citigroup, AIG, General Motors, Chrysler, and the financing arms of GM and Chrysler. The Special Master released his set of decisions in October 2009.

Since taxpayers had become the major stakeholder in the seven "special assistance" firms, the government arguably had a legitimate interest in the firms' compensation policies. One could imagine, for example, embracing an objective of "maximizing shareholder value while protecting taxpayers," or perhaps "maximizing taxpayer return on investment." Ultimately, the Special Master catered to political interests, and adopted an objective of punishing the executives in firms responsible for the meltdown by slashing cash compensation.[116] As shown in Table 4.2, 2009 cash compensation at the three banks regulated by the Special Master were cut by an average of 94%, while total compensation was cut by an average of 64%.

[116] In the interests of full disclosure, we note that one of the authors of this report served as one of the Special Master's two outside advisors. We also note that the fact advice was given does not imply that it was heeded.

Table 4.2 Changes in Pay Imposed by Treasury's Special Master for Seven USA Firms Requiring "Special Assistance"

Corporation	Percentage Change in Pay from 2008 Levels		Percentage Change in Pay from 2007 Levels		Number of Executives in Top 25
	Cash	Total	Cash	Total	
AIG	-90.8%	-57.8%	-89.2%	-55.7%	13
Bank of America	-94.5%	-65.5%	-92.2%	-63.3%	13
Citigroup	-96.4%	-69.7%	-78.4%	-89.6%	21
General Motors	-31.0%	-24.7%	-46.0%	-16.9%	20
Chrysler	-17.9%	+24.2%	+14.0%	+72.3%	25
GMAC	-50.2%	-85.6%	-42.5%	-78.2%	22
Chrysler Financial	-29.9%	-56.0%	na	na	22

Source: October 22 letters from Special Master to each company, available at the USA Treasury website (www.treas.gov).

As an example of the punitive nature of the pay cuts, consider the case of Bank of America's Ken Lewis, who as recently as December 2008 was named American Banker's "Banker of the Year" for his firm's rescue of Merrill Lynch.[117] In October 2009, Mr. Lewis announced he would step down at the end of the year, and indicated that he would forego his 2009 bonus and the remainder of his 2008 salary. The Special Master decided that wasn't enough, and demanded that Mr. Lewis return all the salary earned to date for the year.

4.2. The European Experience

The USA was not the only country to place restrictions on pay in financial institutions requiring government bailouts. Initially, the focus of the constraints in both the USA and Europe was not on "banker bonuses" defined broadly (because little information was available about these payouts) but rather on severance and other payments for the top executives at the failing firms. In many cases, companies took "pre-emptive" actions reflecting both the public mood and in anticipation of government action. In October 2008 (following the first round of government bailouts on both sides of the Atlantic):[118]

- French business leaders had adopted a "code of conduct" preventing severance payments for failed executives.

[117] Fitzpatrick and Scannell, "BofA Hit by Fine Over Merrill --- Bank Pays SEC $33 Million in Bonus Dispute; Sallie Krawcheck Hired in Shake-Up," *Wall Street Journal* (August 4, 2009), p. A1.

[118] The October 2008 description is based largely on Lublin and Esterl, "Executive Pay Curbs Go Global," *Wall Street Journal* (October 21, 2008), p. A1.

- The German cabinet imposed a €500,000 annual salary cap and other limits on top executives of banks that received capital injections or sold troubled assets under that nation's rescue plan. In addition to the salary limits, executives in the bailed-out banks were prohibited from exercising stock options or receiving bonuses, option grants, and severance payments until the government was paid back. Germany's largest bank – Deutsche Bank AG – announced that its top ten executives would forego 2008 bonuses even though the bank was not intending to participate in the government bailout.[119]

- Top executives of the Netherlands' ING Groep NV agreed to forego 2008 bonuses and limit severance payments in exchange for a government capital injection.

- As a condition of receiving bailout funds, Swedish banks had to reach an agreement with the Swedish government limiting compensation for "key executives."

- Executives at Swiss banker UBS AG agreed as part of its recapitalization to use "international best practices" for executive pay, and to allow government monitoring of its pay practices.

In March 2009, following the Merrill Lynch and AIG revelations in the USA, the anger over executive pay expanded from top-executive compensation to a broader attack on the banking bonus culture:

- Germany's finance minister demanded the return of €58 million in "obscene" bonuses from nine executives at Dresdner Bank, which had a loss of €6.3 billion in the prior year. While Dresdner's former CEO had waived his right to a €3.6 million severance package, the public was particularly incensed at the €7.5 million awarded to the head of Dresdner's investment banking division (responsible for most of the 2008 losses).[120]

- In anticipation of public criticism, Italy's UniCredit SpA and Germany's Commerzbank AG announced that its investment banking staff would be paid no bonuses for 2008 unless there was a legal requirement to do so.[121]

- In France, public condemnation by President Sarkozy of Societe Generale's executive stock-option awards led the company to cancel the awards; BNP Paribas SA followed

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[119] As noted in Section 4.1, Deutsche Bank (along with France's Societe Generale) ended up receiving more than €8 billion each under USA TARP payments to AIG.

[120] "Call for Dresdner execs to return bonuses get mixed response," *Banking Newslink* (March 31, 2009).

[121] Wilson, "Financial News: Unicredit pulls bonuses at its investment bank," *Wall Street Journal Europe* (March 9, 2009a), p. 22.

suit and announce it would abandon option awards. Pressures to limit bonuses more broadly mounted after the French bank Natixis SA revealed plans to pay 3,000 traders and other employees €70 million in bonuses for 2008; Natixis had a loss of €2.8 billion the prior year, and had received €2.0 billion in a state bailout package. As a result of these pressures, on 30 March the government imposed a ban on all option grants until at least the end of 2010 for any bank or automaker receiving government assistance, and also banned bonuses not expressly linked to previously set targets.[122]

- On 2 April, the "Group of 20" (G20) leading economies established the Financial Stability Board (FSB) to flag potential problems in the global financial system. The newly formed FSB immediately issued guidelines for banking bonuses, recommending that bonuses should be adjusted for the risk the employee takes, should be linked to performance, should be deferred to take account of the duration of the risks being taken, and should be paid in a mixture of cash and equity.[123]

The controversy over banker bonuses continued to simmer throughout the summer, and erupted at the end of August ahead of the 24 September G20 summit in Pittsburgh:

- On 14 August, Germany's banking regulator, BaFin, announced new rules allowing for "clawbacks" of individual compensation.[124]

- On 26 August, French President Sarkozy indicated that he would push for limits on banking bonuses at the G20 summit. The UK and Germany quickly indicated their support.[125] On the same day, Mr. Sarkozy announced sweeping new rules for banking bonuses in France. Under the new rules, traders cannot receive more than one-third of their bonus in cash the current year. The remaining two thirds must be staggered over the following two years, paid in part in restricted shares, and be subject to forfeiture if the trader's department loses money over that time.

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[122] Moffett, "France Faces Pressure Over Bonuses As Natixis Sets $94.6 Million Payout," *The Wall Street Journal* (March 28, 2009), p. B5; Gauthier-Villars, "Leading the News: Sarkozy, banks set new limits on bonuses --- Pay czar to monitor best-paid traders at France's banks," *Wall Street Journal Europe* (August 26, 2009), p. 3.

[123] Larsen, "Rules unlikely to end bonus furore," *Financial Times* (April 2, 2009).

[124] Smith, "Germany's BaFin Clamps Down On Bank Risk Mgmt, Bonuses," *Dow Jones International News* (August 14, 2009).

[125] "UK joins issue with France on bonus issue," *Global Banking News* (August 26, 2009); "Germany backs calls to limit banker bonuses," *Agence France Presse* (August 28, 2009); "France, Germany want bonus curbs," *The Times* (September 1, 2009), p. 36.

Mr. Sarkozy's announcement was in part a reaction to news that BNP Paribas SA (who had canceled scheduled option awards the prior year) had set aside €1 billion for 2009 bonuses. Following the new rules, BNP Paribas cut its scheduled bonuses in half, and BNP Paribas, Societe Generale, and Credit Agricole and agreed to new rules on banking pay and disclosure of bonus payments.[126]

- On 2 September, the Finance Ministers from the 27 European Union countries met to discuss banking bonuses. By the conclusion of the meeting, Belgium, Luxembourg, the Netherlands, Germany, and Sweden all indicated their support for the French model.[127] On the same day, UK Prime Minister Gordon Brown, French President Sarkozy, and German Chancellor Merkel co-signed a letter to the EU president supporting regulations where bonuses are deferred and subject to forfeiture if performance deteriorates in the future.[128]

- On 3 September, the head of Sweden's central bank called for discussions on banking bonuses at the G20 summit, claiming that "it's not appropriate that we have bonuses that allow people to cash in big and then ruin the system."[129]

- On 4 September, the finance ministers of France, German, Italy, Luxemborg, the Netherlands, Spain, and Sweden jointly called for a ban on all guaranteed bonuses and deferral of all other bonuses over several years.[130]

- On 5 September, the G20 finance ministers met in London, concluding as a group that banking bonuses were a key cause of the financial crisis. The G20 countries agreed that they would implement tax and other policies to encourage banks to reward long-term rather than short-term success. However, the group failed to agree on specifics of bonus regulations: the German and French ministers argued for strict caps on bonuses based on short-term gains, while the USA Treasury Secretary argued that the focus should be on requiring banks to hold more capital, and not global restrictions on compensation.[131]

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[126] Davies, "France announces bank bonus crackdown and urges G20 nations to follow suit," *The Guardian* (August 26, 2009), p. 23; Inman, "Finance ministers disagree on bonuses," *Australian Financial Review* (September 3, 2009), p. 16.

[127] ; Annan, "EU Finance Ministers Back Curbing of Bank Bonuses," *IHS Global Insight Daily Analysis* (September 4, 2009).

[128] Monaghan, "Brown sets out plan for bonus clampdown," *Daily Telegraph* (September 4, 2009a), p. 1.

[129] "Sweden central bank chief: banking bonuses need to change," *Reuters News* (September 3, .

[130] "G20 : Buzek Backs Calls to Limit Bankers' Pay," *Europolitics* (September 10, 2009).

[131] Lekakis, "Bank executives face $50m loss under bonus bans," *The Advertiser* (September 7, 2009), p. 55; "G20 punts on bank bonuses," *UPI Energy Resources* (September 5, 2009)

> Italian Prime Minister Berlusconi also indicated that his country would not support a cap on bonuses, arguing that limiting speculation is more important than limiting banking bonuses.[132]

Ultimately, President Sarkozy's hope for the G20 nations to agree to a global cap on banking bonuses failed after the UK and USA indicated that the proposed cap was too restrictive.[133] However, at the Pittsburgh G20 summit, the world leaders agreed to pay regulations proposed by the Financial Stability Board. Under the FSB proposals, which would apply only to the finance sector:

- At least 40% of each executive's bonus would be deferred over a number of years, rising to 60% for the bonuses of the most senior executives.
- The deferral period should be at least three years with at least half paid in the form of restricted shares rather than cash.
- Cash payments should be subject to clawback provisions.

The FSB's proposals were designed as an international framework, leaving it to each country to pass country-specific legislation to implement it. Ultimately, in spite of the fact that President Obama had agreed to the FSB framework, the USA's Federal Reserve (the key banking regulator in the USA) ultimately rejected the FSB recommendations, arguing that a single formula-based approach could exacerbate excessive risk taking.[134] However, most EU countries embraced the recommendations and committed to have legislation in effect by early 2010. By late 2009, German banks agreed to voluntarily adopt the FSB recommendations ahead of formal legislation, and the Italy's central bank began pressuring its country's six largest banks to comply immediately.[135] By March 2010, eight G20 countries – including the UK, France, and Germany – had adopted new compensation regulations consistent with the FSB recommendations.

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[132] "Fighting Commodities Speculation Priority,Not Bank Pay: Italy PM," *Dow Jones International News* (September 8, 2009).

[133] Jagger and Frean, "Sarkozy back-pedals over his demands for worldwide cap on banking bonuses," *The Times* (September 25, 2009), p. 2.

[134] Braithwaite, et al., "Fed rejects global formula for bonuses," *Financial Times* (October 22, 2009).

[135] Wilson, "German banks set to speed up pay reform," *Financial Times* (December 10, 2009b); "C-bank calls upon Italian banks to stick to managers' pay rules," (October 29, 2009). Italy's UniCredit indicated that it was already in full compliance "Unicredit: New Salary Regulations Already Implemented," *ANSA - English Corporate News Service* 2009);

The FSB recommendations did not end the banking-bonus controversies. In November 2009, the UK adopted new rules requiring banks to publicly disclose the number of employees earning more than £1 million (€1.05 million). On 9 December, the British Government announced plans to impose a one-time 50% corporate tax on all banking bonuses above £25,000 (€26,250); the UK Treasury estimated that tax would affect between 20,000 and 30,000 bank employees, and would raise £550 million (€578 million). Two days later, France imposed a similar one-time 50% corporate tax on banking bonuses above €27,500, using a narrower definition of "bankers" (as "market operators trading financial instruments that could affect the bank's risk exposure") and expected to affect between 2,000 and 3,000 such bankers.[136] On the same day, Finland's Financial Supervisory Authority announced it would be imposing rules to ensure that banking bonuses would be composed primarily of fixed salaries (and not bonuses).[137]

4.3. How Incentive Pay Can Increase Risk (and How to Fix It)

The ongoing global outrage over banking bonuses reflects two primary factors. The first is the sheer audacity of bankers receiving bonuses so soon after their firms needed massive government bailouts, coupled with the fact that the 2009 banking profits were driven in part from the banks' ability to borrow from the government at artificially low interest rates while lending to the public at market rates. The second factor is the suspicion that the banking bonus culture created incentives for excessive risk taking that led to the meltdown of world financial markets.

There are exactly two ways that bonuses – or incentive compensation more broadly – can create incentives for risk taking. The first way is through asymmetries in rewards for good performance and penalties for failure, as suggested by the title of Cuomo (2009) Report ("The 'Heads I Win, Tails You Lose' Bank Bonus Culture"). When executives receive rewards for upside risk, but are not penalized for downside risk, they will naturally take greater risks than if they faced symmetric consequences in both directions. The classic example of asymmetries (or what economists call "convexities") in the pay-performance

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[136] Castle, et al., "France joins U.K. to curb big bonuses by the banks; Combined assault aimed at pressuring others to limit financial institutions," *International Herald Tribune* (December 11, 2009), p. 4; Castle, et al., "France joins Britain in a levy on bonuses; United call for bank tax is meant to raise pressure on U.S. and other nations," *International Herald Tribune* (December 12, 2009), p. 11; Hall, "French government backs bonus windfall tax," (December 16, 2009).

[137] Esmerk, "Finland: Banking and insurance sector bonuses to be restricted," *Esmerk Finnish News* (December 11, 2009).

relation implicit in stock options, providing rewards for stock-price appreciation above the exercise price, but no penalties (below zero) for stock-price depreciation below the exercise price. Executives with options close to expiration that are out of the money have strong incentives to gamble with shareholder money; executives with options that are well in the money have fewer such incentives.

The second way that incentive compensation can create incentives for risk taking is through performance measurement. For example, in the years leading up to its dramatic collapse and acquisition by JPMorgan Chase at fire-sale prices, Washington Mutual excelled at providing loans and home mortgages to individuals with risky credit profiles.[138] WaMu mortgage brokers were rewarded for writing loans with little or no verification of the borrowers assets or income, and received especially high commissions when selling more-profitable adjustable-rate (as opposed to fixed-rate) mortgages. After launching the "Power of Yes" campaign in January 2003, the revenue from the bank's home-lending unit grew from $700 million to almost $2 billion in less than a year, and its adjustable-rate loans grew from 25% of WaMu's new home loans in 2003 to over 70% by 2006. Most of WaMu-originated loans were packaged and sold to Wall Street; WaMu routinely pressured appraisers to generate inflated property values so that these packaged loans would appear less risky. Nonetheless, the value of bad loans on WaMu's books grew from $4.2 billion in mid-2007 to over $11.5 billion in mid-2008. Regulators seized the bank in September 2008, selling its assets to JPMorgan for $1.9 billion – a year before WaMu's market capitalization had exceeded $30 billion.

The basic incentive problem at WaMu was a culture and reward system that paid people to write loans rather than to write "good loans" – that is, loans with a decent chance of actually being paid back. In the end, WaMu got what it paid for. Similar scenarios were being played out at Countrywide Finance, Wachovia, and scores of smaller lenders who collectively were not overly concerned about default risk as long as home prices kept increasing and as long as they could keep packaging and selling their loans to Wall Street. But, home prices could not continue to increase when prices were being artificially bid up by borrowers who could not realistically qualify for or repay their loans. The record number of foreclosures in 2008, and the associated crash in home values, helped send the U.S. economy (and ultimately the global economy) into a tailspin.

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[138] The information in this paragraph is based on Goodman and Morgenson, "By Saying Yes, WaMu Built Empire on Shaky Loans," *New York Times* (December 27, 2008).

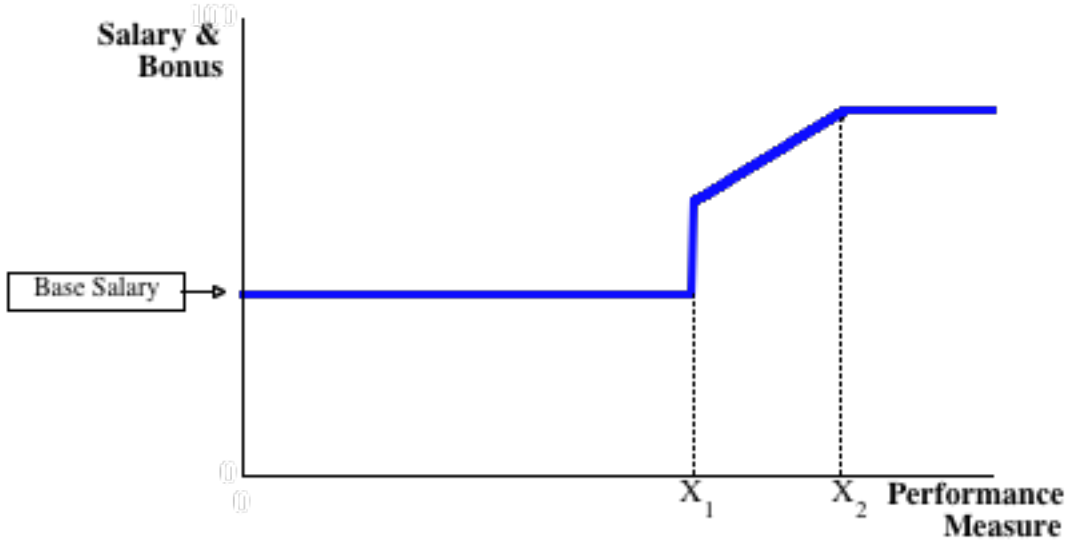
In the current anti-banker environment, it has become fashionable to characterize plans such as those at Washington Mutual as promoting excessive risk taking. But, the problems with paying loan officers on the quantity rather than the quality of loans is conceptually identical to the well-known problem or paying a piece-rate worker based on the quantity rather than the quality of output, or the well-known problem of paying executives (or investment bankers) based on short-term rather than long-term results. Put simply, these are performance-measurement problems, not risk-taking problems, and characterizing them as the latter leads to impressions that the problems are somehow unique or more important in the banking sector, when in fact they are universal.

Before describing how compensation plans can be improved to mitigate problems with both asymmetries and performance measurement problems, it is worth noting that the challenge historically has been in providing incentives for executives to take *enough* risk, not too much risk. As discussed in Section 2.2.2, executives are typically risk averse and undiversified with respect to their own companies' stock-price performance. On the other hand, shareholders are relatively diversified, placing smaller bets on a larger number of companies. As a result, executives will inherently be "too conservative" and want to take fewer risks than desired by shareholders. Indeed, stock options (or other plans with convex payouts) have long been advocated as ways to mitigate the effects of executive risk aversion by giving managers incentives to adopt rather than avoid risky projects (see, for example, Hirshleifer and Suh (1992)). Similarly, there is a long history of attempts to document empirically a relation between convexities and actual risk-taking incentive, and the results have been relatively modest.[139]

To show how poorly designed pay-performance relations can cause a host of problems (including excessive risk taking), consider the typical executive cash compensation (salary and bonus) schedule illustrated in Figure 4.1. As depicted, no bonuses are paid until performance reaches X_1, at which point the executive receives a sizeable bonus (e.g. half of his target bonus). Bonuses continue to increase with performance until X_2, at which point bonuses are "capped" regardless of subsequent increases in performance.

[139] DeFusco, et al. (1990) find some evidence that stock-price volatility increases, and traded bond prices decrease, after the approval of executive stock option plans. Similarly, Agrawal and Mandelker (1987) find some evidence that managers of firms whose return volatility is increased by an acquisition have higher option compensation than managers whose volatility declined

Figure 4.1 Typical Cash Compensation Plan



Note:

It is easy to see how the schedule depicted in Figure 4.1 can lead to risk taking, especially if performance without risk taking would end up below X_1. Executives anticipating performance $X < X_1$ have nothing to lose (except, perhaps, their jobs) by gambling on an investment that might push them past X_1. Moreover, the schedule depicted can also lead to greater volatilities in realized performance. Suppose an executive can generate constant performance just below X_1 each year, or alternatively can generate performance well below X_1 in some years, and above X_1 in alternating years. Executives paid based on the schedule in Figure 4.1 would prefer variable performance to constant performance.

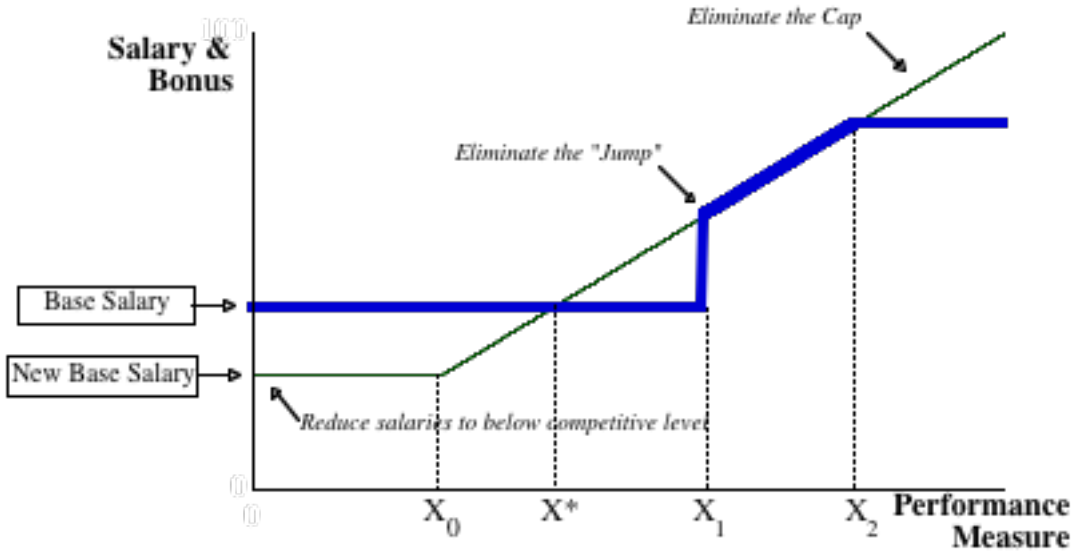
The typical schedule depicted in Figure 4.1 generates a treasure trove of dysfunctional incentives well beyond risk taking. Consider, for example the effect of the "jump" or discontinuity of bonus payments at performance level X_1. Executives who believe they cannot achieve at least this level of performance this year will either stop producing or "save" profits for next year by delaying revenues or accelerating expenses. These are the forces that lie behind the commonly observed practice of managers delaying the delivery and/or invoicing of sales, or prepaying expenses that would normally be paid in the next period. Such behavior is motivated by the fact that these plans impose no bonus penalty for missing the performance threshold by a lot instead of a little (as the figure shows). And if executives see that they are not going to make the bonus pool this year, they are better off to take an even bigger hit this period (at no cost to them in terms of their bonus) so they can do even better next period—what accountants for years have called the "big bath" phenomenon. On the other hand, executives who are struggling to make the lower threshold, but still

believe they can make that threshold, have incentives (provided by the threshold bonus) to do whatever is necessary to achieve the lower threshold. Their actions commonly include destroying value by loading the distribution channel so as to recognize revenues earlier, unwisely reducing R&D and required maintenance expenditures, and offering excessive sales discounts for purchases completed prior to the end of the period. Each of these actions shifts profits from next period to the current period, but does so at an unnecessary cost to the firm.

Similarly, consider the effect of capping bonuses when performance exceeds X_2. Executives capable of producing well above X_2 in any period have incentives to stop producing once they "max out" on their bonuses. In addition, they will do their best to transfer performance results that could have been realized this period into the next period. Rational executives will "smooth earnings" by manipulating sales and expenses to make sure that performance lies between X_1 in and X_2 each period. Such manipulation of sales and expenses almost always is associated with higher long-run costs and/or lower long-run revenues.

The incentive problems apparent in Figure 4.1 largely reflect that fact the pay-performance relation is "non-linear" in the sense that the effect of increased performance on bonuses varies with performance, from zero well below X_1 to virtually infinite close to X_1 and zero again above X_2. These problems can therefore be mitigated by making the pay-performance relation linear over a broader range of performance. Figure 4.2 illustrates how compensation can be designed to avoid many of the risk-taking and other dysfunctional incentives inherent in Figure 4.1. First, the cap on bonuses at X_2 is removed incentives to withhold effort or defer profits when the cap is binding. Second, the jump at X_1 is removed to solve the plethora of problems that arise whenever pay-performance schedules have discontinuities. Finally, to extend the linearity of the schedule further, the base salary is reduced to below competitive levels, and the target or expected bonus is increased.

Figure 4.2 Improve incentives by lowering salaries and removing caps or jumps



Note:

While Figure 4.1 has not completely solved the incentives and risk issues (because performance below X_0 can still cause problems), we have greatly (and simply) reduced their scope. Executives no longer profit from risk taking such that good years (when rewards are high) are followed by bad years (when penalties are capped at zero), provided that performance remains above X_0). To make executives accountable for performance below X_0, the schedule in Figure 4.1 can be improved further by imposing "negative bonuses" for especially poor performance. Indeed, Figure 4.1 already illustrates how salary reductions can effectively introduce negative bonuses for performance between X_0 and X_1, since the executive in this range will receive compensation below his former base salary.

Conceptually, negative bonuses can be implemented by asking the executive to write a check back to the company in bad years, but this scheme is difficult to implement, especially after the executive has paid taxes of the bonuses. A more palatable way of achieving negative bonuses is through deferred bonuses that are subject to partial forfeiture if performance deteriorates. An example of this type of plan is the "bonus bank" pioneered by Stern Stewart and Co. and first implemented by Coca Cola and Briggs and Stratton in 1988 and 1989.[140] Bonus banks are structured so that a positive bonus is not paid out entirely in cash each period. Instead the bonus is deposited into the executive's bonus bank account. The executive receives a cash distribution equal to a fixed fraction of the account balance each year, while

[140] The Stern Stewart bonus banks are described in Stewart (1990) and Stewart (1991). Under the typical Stern Stewart plan annual bonuses are deposited into the bonus bank and the executive draws one third of the bank balance each year.

the remaining balance is "at risk" to fund negative bonuses in future years. To make this approach work, it helps if the formula produces positive bonuses over the first few years to build a healthy balance in the account. Alternatively, the executive could forgo some fraction of his base salary each year to pre-fund the bonus bank.

For senior executives, negative bonuses can be introduced by paying bonuses partially in restricted stock or options. These plans penalize executives when performance deteriorates, since the value of the stock or options will naturally fall. In addition, the board can retain the right to cancel vesting of restricted stock or exercisability of options.

Negative bonuses are especially important in cases where the executive is paid "too much" in a prior year, due to revisions in performance data not apparent until after the bonus was paid. Such revisions include, but are not limited to, formal restatements of accounting numbers such as earnings or revenues due to mistakes, over-optimistic assumptions, "managed earnings," outright fraud or short-term oriented decisions by management that generated profits in an earlier period but lead to substantial long-run value destruction. Boards must always reserve the right to recover the ill-gained rewards in these situations. Provisions to allow such recovery have recently been labeled as "clawback arrangements" since the company is "clawing back" rewards that had already been paid. Such clawback arrangements are typically not legally enforceable (and executives can often escape repayments by resigning), thus clawback provisions are typically not as effective as bonus banks or deferrals.

4.4. Did Banking Bonuses Cause the Financial Crisis?

The heavy reliance on bonuses has been a defining feature of Wall Street compensation for decades, going back to the days when investment banks were privately held partnerships. Such firms kept fixed costs under control by keeping base salaries low and paying most of the compensation in the form of cash bonuses that varied with profitability. This basic structure remained intact when the investment banks went public, but the cash bonuses were replaced with a combination of cash, restricted stock, and stock options.

The fact that (1) the financial meltdown involved banks, (2) banks rely heavily on bonuses, and (3) pay levels in banks are high, have led many in the political sector or popular press to presume that banking bonuses much have caused the crisis and thus needs to be reformed. But, researchers have been (so far) unable to document a causal link between the structure of compensation in banks and the crisis. For example, Fahlenbrach and Stulz (2010)

analyze 2006 executive incentives and subsequent bank performance, and finds that the USA banks where the CEOs were better aligned with shareholders actually performed worse during the crisis. Similarly, Cheng, Hong and Scheinkman (2009) find that executives with better incentives (which they defined based on residuals from annual compensation regressions) have higher CAPM betas, higher return volatilities, and are more likely to be in the tails of performance (with especially high pre-crisis performance, and especially low performance during the crash). Bechmann and Raaballe (2009) analyze CEO pay and performance in a sample of Danish banks, and also find that CEOs with more incentive-based compensation (and thus more to lose from poor performance) performed worse than other banks during the crisis. Therefore, while there appears to be a correlation between compensation structures and performance during the crisis, the companies faring the worst in the crisis are those with better (and not worse) executive incentives.

As discussed in Section 4.3, the primary way that compensation structures might encourage excessive risk taking is through asymmetric rewards and penalties; that is, high rewards for superior performance but no real penalties for failure. Financial services firms provide significant penalties for failure in their cash bonus plans by keeping salaries below competitive market levels, so that earning a zero bonus represents a penalty, as advocated in Figure 4.1. Indeed, much of the outrage over bonuses in financial services reflects the fact that, in most industries, a "bonus" connotes an extraordinary reward for extraordinary performance added on top of generous above-market salaries. But, the facts are that salaries in financial service firms represent a small portion of total compensation and the "bonuses" are not bonuses on top of normal salaries, but are rather a fundamental part of competitive compensation. Take away the bonuses, and the banks will have to raise salaries or find other ways to pay, or they will lose their top talent.

Table 4.3 Comparison of 2006 and 2008 Bonuses and Year-End Wealth for CEOs of Banking and Non-Banking Firms

	EUROPE		*UNITED STATES*		
	Banks	Non-Banks	TARP Banks	Other Banks	Non-Banks
Average Bonuses (€000s)					
Number of CEOs	30	617	45	44	990
2006	1,443.8	485.7	1,174.7	1,176.7	1,303.5
2008	433.3	419.6	216.9	745.4	1,015.1
Difference	-1,010.5 (-70.0%)	-66.1 (-13.6%)	-957.8 (-81.5%)	-431.3 (-36.7%)	-288.4 (-22.1%)
Median Bonuses (€000s)					
Number of CEOs	30	617	45	44	990
2006	938.3	261.4	501.7	500.6	699.3
2008	0	235.6	0	209.7	464.4
Difference	-938.3 (-100.0%)	-25.8 (-9.9%)	-501.7 (-100.0%)	-290.9 (-58.1%)	-234.9 (-33.6%)
Median Wealth (€000s)					
Number of CEOs	21	411	45	44	990
2006	13,403.1	4,102.1	24,618.4	27,413.4	20,715.5
2008	5,156.0	2,306.0	4,835.9	9,509.3	8,514.7
Difference	-8,247.1 (-61.5%)	-1,796.1 (-43.8%)	-19,782.5 (-80.4%)	-17,904.1 (-65.3%)	-12,200.8 (-58.9%)

Note: CEO Wealth is defined as the fiscal year-end value of the CEO's stock, restricted stock, and the Black-Scholes value of stock options. Sample includes all companies from Table 3.2 where with sufficient data to calculate year-end portfolios. European data are from BoardEx; USA data (including Black-Scholes values) are calculated by us based on year-end option holdings. Market Value is the year-end market value of the firm's equity. Monetary amounts are in 2008-constand Euros. CEOs with zero holdings of stock and options are excluded. US dollar-denominated data are converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

Table 4.3 compares the average and median 2006 and 2008 bonuses, and the year-end median value of shares and options held, for European banks and non-banks and for USA banks and non-banks (where the USA banks are divided into those receiving government assistance ("TARP Banks") and those not receiving such assistance). The average bonus for European banking CEOs fell by over €1 million (70%) from 2006 to 2008, compared to relatively modest declines for non-banking CEOs. The median bonus for European banking CEOs fell 100% from over €900,000 in 2006 to zero in 2008, again compared to only modest declines in the non-banking sector. Moreover, the European banking CEOs not only

Table 4.4 Incentives for Banking and Non-Banking CEOs, by Continent and Sector

	EUROPE		*UNITED STATES*		
ESTIMATED PAY-PERFORMANCE ELASTICITIES	Banks	Non-Banks	TARP Banks	Other Banks	Non-Banks
Shareholder Return	.382***	.056***	.677***	.532***	.002
Sales Growth	.156	.078***	.611**	.463***	.417***
Δ(Return on Assets)	1.747**	.677***	5.637	4.32***	.446***
Europe Excluding UK and Germany					
Shareholder Return	.486***	.036	—	—	—
Sales Growth	.146	-.061	—	—	—
Δ(Return on Assets)	4.74	.715***	—	—	—
AVERAGE COMPOSITION OF 2003-2006 COMPENSATION					
Base Salary	44%	51%	27%	28%	28%
Bonuses	30%	20%	28%	28%	25%
Equity-Based	20%	21%	39%	34%	41%

Note: Data are based on same-CEO first-differences from 2003-2008. Pay-Performance elasticities are calculated from a regression of ΔLn(CEO Pay) on one or all three performance measures; regressions include year dummies and (for non-banks) additional controls for industry. For the purposes of these regressions, $(\text{Stock Return})_t$ is defined as Ln(1+Shareholder Return) for period t; ΔROA is defined as the year-over-year change in ROA (defined as net income before extraordinary items plus interest divided by average assets over the year); and sales growth is defined as $\Delta\text{Ln}(\text{Sales})_t$. Monetary data are converted to 2008-constant US dollars, adjusted for inflation, and then converted to Euros using the 2008 year-end exchange rate (€1 = $1.3919).

*,**,*** indicates that the pay-performance elasticity is significantly different from zero at the 10%, 5% and 1% levels, respectively.

had more wealth to lose than their non-banking counterparts (median 2006 wealth in company stock of €13.4 million in banks compared to only €4.1 million in non-banks), but indeed they lost more (62% compared to 44%). Overall, the results for European banking CEOs are similar to the results for those for USA bankers receiving government bailouts, and are inconsistent with the idea that banking executives faced rewards for success but no real penalties for failure.

In Table 3.7, we showed that – with the exception of Germany and the UK – there is no evidence that bonuses for European CEOs is related to stock-price performance. Table 4.4 provides a similar analysis for the banking and non-banking subsamples. As shown in the Table, the elasticity of cash compensation to shareholder value is positive and significant for banking CEOs; the estimated elasticity of .382 suggests that cash compensation increases by

Table 4.5 Comparison of 2006 and 2008 Year-End Values for Stock Options for USA CEOs of TARP and non-TARP Recipients

	TARP Recipients	Non-TARP Banks	Other Non-TARP Companies
Number of CEOs	35	29	675
Percentage of Options in the Money			
2006 Fiscal Year-End	92.2%	82.3%	91.3%
2008 Fiscal Year-End	18.0%	43.5%	37.7%
Average Value of Options (€000s)			
2006 Fiscal Year-End	€21,998.1	€9,096.9	€20,469.1
2008 Fiscal Year-End	€1,189.7	€2,588.4	€5,487.5
Change in Value of Options	-€20,808.4 (-94.6%)	-€6,508.5 (-71.5%)	-€14,981.6 (-73.2%)
Median Value of Options (€000s)			
2006 Fiscal Year-End	€7,080.5	€4,206.0	€8,218.8
2008 Fiscal Year-End	€156.1	€740.9	€1,323.2
Change in Value of Options	-€6,924.4 (-97.8%)	-€3,465.1 (-82.4%)	-€6,895.6 (-83.9%)

Notes: Sample includes executives in S&P 500, S&P MidCap 400, and S&P Small Cap 600 Firms who held the title of Chief Executive Officer in both 2006 and 2008. Option and stock data from S&P's ExecuComp database. TARP recipients include companies receiving money from the TARP as of March 2010. Non-TARP banks defined as companies with SIC codes between 6020 and 6299 and include commercial banks, savings institutions, mortgage banks, and security and commodity brokers, but exclude investment advisors (SIC 6282). Average value for options based on year-end parameters and prices. Average value equals the restricted shares held at the end of the fiscal year multiplied by the year-end stock price.

about 4% for each 10% increase in shareholder returns. The pay-performance elasticity for banking CEOs remains large and significant even after excluding German and British firms (while the estimated elasticity outside of banking is insignificant after excluding these firms). Therefore, while we concluded in Section 3.2.3 that there was an absence of alignment between European CEOs and shareholders, the analyses in Table 4.3 and Table 4.4 suggest one sector with better alignment: banking. In particular, compared to non-banking CEOs, European banking CEOs have more wealth invested in company stock, faced larger penalties for poor performance, and have bonus plans that are more sensitive to company stock-price performance.

Table 4.5 provides additional comparisons of banking and non-banking CEOs based on data available only in the USA. The top panel shows that over 90% of the stock options held by CEOs of TARP recipients were "in the money" (that is, had a stock price above the exercise price) at the end of the 2006 fiscal year, and that these stock options had an average

(and median) Black-Scholes value of €22 million (and €7.1 million). By year-end 2008, only 18% of the CEO options were in the money, the average value had fallen by 95% to only €1.2 million, and the median value had fallen by 98% to only €156,100. The dramatic declines are much steeper than observed in banks not receiving government funds, or for USA firms outside of the banking sector.

4.5. If Not Banking Bonuses, What Caused the Financial Crisis?

The precise causes of the global financial crisis will be debated for decades (just as the precise causes of the 1930s depression are still being debated), and it is beyond both the scope of this report and of our abilities to provide a detailed account here.[141] However, the evolving consensus suggests that the risk-taking contributing to the crisis reflected a combination of factors (at least in the USA) having nothing (or little) to do with the banking bonus culture, including social policies on home ownership, loose monetary policies, "Too Big to Fail" guarantees, and poorly implemented financial innovations such as exotic mortgages, securitization, and collateralized debt obligations.

The USA housing crisis, for example, can be traced not to banking bonuses but to progressive government tax and social policies stretching back to the 1970s.[142] With respect to tax policies, the USA (along with the Netherlands, Sweden, and Switzerland) are the only developed countries allowing deductions for mortgage interest for personal taxes. Recent social policies to expand homeownership can be traced to the passage of the Home Mortgage Disclosure Act (HDMA) in 1975, which required mortgage lenders to provide detailed information on mortgage applications. In 1977, when these new data suggested that some banks were providing loans only in low-risk suburbs rather than intercity areas, the government passed the Community Reinvestment Act that required banks to offer loans throughout all the areas in which they operated. In 1991, the HDMA was expanded to allow comparisons of loan rejection rates by race. In 1992, the Federal Reserve Bank of Boston published the results of a study based on these new data showing that minorities were more

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[141] A sampling of the emerging surveys include Brunnermeier (2009); Taylor (2009); Kling (2009); Boyd, et al. (2009); and Kashyap, et al. (2008). For evidence on the role of corporate governance mechanisms (beyond executive compensation) during the crisis, see Erkens, et al. (2010) and Beltratti and Stulz (2009).

[142] Much of the information in this paragraph is based on Liebowitz (2009), who observes that government intrusion in the USA housing market actually began following the housing collapse in the 1930s. In 1934, for example, the USA government created the Federal Housing Administration (FHA), which guaranteed mortgages against default (thus protecting banks from risk), and also created Fannie Mae to purchase FHA mortgages.

likely than whites to be denied mortgages after purportedly controlling for a variety of factors proxying for creditworthiness.

The Boston Fed study – which has by now been largely discredited (Liebowitz (2009)) – was a lighting rod for government intervention to loosen lending standards and make housing available to a broader set of the population. Congress passed a bill mandating that Fannie Mae and Freddie Mac (the government supported entities that purchased mortgages) increase their acquisitions of loans made to lower-income borrowers. The Boston Fed issued a follow-up report titled, "Closing the Gap: A Guide to Equal Opportunity Lending," suggesting that traditional measures of creditworthiness where discriminatory and should be largely ignored when cultivating business from minority customers. The report helped facilitate creative underwriting standards and spurred the popularity of adjustable rate mortgages (or ARMs, where borrowers could be qualified based on artificially low initial "teaser" rates even when their income was not sufficient to repay the mortgages at market rates). The popularity of ARMs grew in the early 2000s, as the Federal Reserve maintained interest rates significantly below historical experience (Taylor (2009)). While the Fed's short-term rates are not highly correlated with rates on 30-year fixed-rate mortgages, they are highly correlated with initial teaser rates on ARMs, and thus sparked more demand for ARM-financed housing.

The increase in home ownership caused by a loosening of underwriting standards was in turn associated with an unparalleled appreciation in housing prices. Default rates were unusually low, since borrowers who could not afford to repay their mortgages could refinance (taking money out to fund future mortgage payments) or sell their house at a profit. Mortgage lenders were happy to continue lending under the lax standards, since even foreclosures would not be costly for the lenders as long as prices kept appreciating. Thus, as discussed above, mortgage lenders such as Washington Mutual provided rewards focused on the quantity of loans written rather than on their quality.

Financial innovation also led mortgage lenders to pay less attention to the credit-worthiness of the borrowers. In particularly, mortgages were increasingly pooled together and sold as mortgaged-back securities. While such "securitization" can provide for efficient ex post risk allocation, it creates ex ante "moral hazard" problems since the loan officer will care only about the quantitative measures of creditworthiness required for securitization, and will ignore important qualitative aspects that would be considered important if the bank were

intending to hold the loan in its own portolio.[143] The loan officer was even further removed from the ultimate repayment when the mortgage-backed securities were restructured as a collateralized-debt obligation (CDOs) and sold to investors in difference tranches according to their purported risk.

The behavior of USA borrowers, lenders, and investors seemed predicated on the assumption or expectation that housing prices would continue to appreciate. Ultimately, home prices that were being artificially bid up by borrowers who could not realistically qualify for or repay their loans could not continue to increase. When home prices began falling, borrowers who previously would have refinanced or sold their homes at a profit could do neither, which escalated the pace of foreclosures. Banks who would previously break even on foreclosed properties now faced huge losses, and the investors of the associated mortgaged-back securities or CDOs also suffered. The globalization of world trade and long-term capital meant that banks and investors worldwide were affected by the burst in the USA housing bubble (Turner (2010)).

The maintained assumption of continued appreciation was a mistake of epic proportions, obvious in hindsight but not during the housing boom. But, it was not a mistake driven by banking bonuses, and most large commercial and investment banks (and their executives) suffered greatly. Indeed, to the extent that compensation systems contributed to the crisis (such as the aforementioned loan officers at Washington Mutual), it was because the bonuses themselves were designed under the assumption of continued appreciation (and not that the bonuses *led* to the assumption of continued appreciation).

4.6. Should Compensation in Banks Be Reformed?

Compensation practices in financial services can certainly be improved. For example, cash bonus plans in financial services can be improved by introducing and enforcing bonus banks or "clawback" provisions for recovery of rewards if and when there is future revision of critical indicators on which the rewards were based or received. Indeed, in the wake of the financial crisis in late 2008, several financial institutions introduced clawback provisions allowing the firm to recover bonuses paid to traders and other employees on profits that subsequently proved to be incorrect. In November 2008, UBS introduced a "bonus malus"

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[143] The moral hazard problem in securitization is limited by "early pay default" clauses that require originators to repurchase loans becoming delinquent within 90 days of securitization (Piskorski, et al. (2010)). We also note that mortgage lenders such as Countrywide kept most of its mortgages in its own portfolio, and CDO underwriters such as Merrill Lynch held onto a large portion of its own mortgage-backed CDOs.

system in which at least two-thirds of senior managers' bonuses in good years are "banked" to offset possible losses in subsequent bad years.[144] In December 2008, Morgan Stanley introduced a clawback feature into its bonuses for 7,000 executives and employees, in which the company could recover a portion of bonuses for employees causing "a restatement of results, a significant financial loss or other reputational harm to the firm."[145] In January 2009, Credit Suisse began paying bonuses in illiquid risky securities that lose value in bad years and could be forfeited if employees quit their job or were fired.[146] We applaud these moves as a good start towards a general adoption of clawback provisions.

Bonus plans in financial services can also be improved by ensuring that bonuses are based on value creation rather than on the volume of transactions without regard to the quality of transactions. Measuring value creation is inherently subjective, and such plans will necessarily involve discretionary payments based on subjective assessments of performance.

Compensation practices in financial services can undoubtedly be improved through government oversight focused on rewarding value creation and punishing value destruction. However, it is highly unlikely that compensation practices can be improved through increased government rules and regulations. Indeed, governments on both sides of the Atlantic have a long history of attempts to regulate executive pay that have systematically created unanticipated side effects that have generally led to higher pay levels and less-efficient incentives.

Part of the problem of governmental regulation of pay is that such interventions – even when well intended – always creates unintended (and usually costly) side effects. In Section 2.1, for example, we saw how Congressional efforts in the USA to reduce golden parachutes in fact guaranteed their expansion, and how the explosion in option grants can be largely traced to efforts to reduce pay levels.

More importantly, regulation is often designed to be punitive rather than constructive, and is inherently driven by politicians more interested in their political agendas rather than creating shareholder value. For example, the draconian restrictions on pay for USA TARP recipients – and the 50% supplemental taxes on banking bonuses in the UK and France – are clearly punitive and politically motivated. While such policies may help reduce public

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144 "UBS to change to the way it pays senior managers," *Associated Press Newswires* (November 17, 2008).

145 Farrell and Guerra, "Top Executives at Morgan Stanley and Merrill forgo their bonuses," *Financial Times* (December 9, 2008).

146 Harrington, "Credit Suisse to loan cash bonuses," *Sunday Telegraph* (January 18, 2009).

outrage, they will also cripple one of the world's most important, and historically most productive, industries.

It is important to recognize that the outrage over banking bonuses is emanating not from shareholders but from politicians, labor unions and the general public. While such outrage is understandable – especially for banks paying bonuses after being bailed out by taxpayers – it is often driven by jealously and envy and not by concerns about maximizing value or even protecting taxpayer interests in the future. Moreover, even for those who believe that CEOs can effectively set their own salaries (e.g., the Bebchuk-Fried "Managerial Power" view discussed in Section 2.5), there is no credible evidence that the compensation arrangements for lower-level bankers, traders, underwriters, or brokers are set in anything other than a highly competitive market for talent. For better or worse, there is an extremely scarce supply of individuals with the highly specialized skills required to understand and trade in increasingly complex derivative instruments, and the market for such individuals is global with little respect for international boundaries. Restricting banking bonuses for TARP recipients in the USA led to a drain of talent from those banks to private equity and unrestricted banks (including those that quickly paid the money bank). Similarly, punitive bonus taxes in France and the UK will lead to a drain of talent from those countries to other countries.

Ultimately, we conclude that improvements in executive compensation will best emanate through stronger corporate governance, and not through direct government intervention.

5. Summary and Policy Implications

5.1. Putting the Pay Controversies in Context

The recent financial crisis has created a public uproar over top-executive pay packages and has led to calls for reform of executive pay in Europe and the USA. Anger over bonuses paid to executives at bailed-out banks have led to supplemental taxes on banker bonuses in the UK and France, and outright prohibitions on bonuses or other incentive payments for USA executives in firms receiving government bailouts. In addition, the crisis has sparked demand for increased government regulation of executive pay more broadly on both sides of the Atlantic.

A primary purpose of this report is to add "context" to the ongoing debate over CEO pay. The current controversy is not the first – nor will it be the last – time that executive compensation has sparked outrage and calls for regulation in the USA and Europe. For this reason, we devoted considerable attention on the evolution of executive pay on both continents. We showed, for example, that many features of executive pay in the USA – including the explosion in stock options that led to the dramatic increase in pay levels in the 1990s – can be traced directly to government accounting, tax, disclosure, and social policies. Similarly, the rise and fall of options in the UK, France, and Italy can also be tied to government policy. In many cases – beginning in the 1950s in the USA and continuing through the 1990s in Europe – government intervention has taken the form of conferring, and then removing and maybe conferring again, tax advantages for options by having the gains taxed as capital gains rather than as ordinary income.

Based on a comprehensive comparison of pay spanning six years and covering approximately 1,500 USA firms and 1,100 firms from ten European countries, we showed that USA CEOs are paid significantly more than their European counterparts even after controlling for company size, industry, and a variety of other firm and managerial characteristics. Moreover, while more than half of the average CEO's pay in the USA comes in the form of stock options or restricted stock, we find that European CEOs receive only about a tenth of their pay in stock or options. Indeed, we conclude that most of the difference in cross-continental pay levels is attributable to the higher use of stock and options in the USA.

Our finding that the "USA Pay Premium" is largely "explained" by the fact that USA CEOs have different pay structures merely shifts the question: Why do American executives USA receive more equity-based compensation than do European executives? We consider (and mostly dismiss) a variety of agency-theoretic explanations that would require European executives to be less productive and more averse to risk and effort than their American counterparts. Ultimately, we conclude that the early 1990s created a "perfect storm" for an explosion of option grants in the USA for not only executives but also for lower-level managers and employees. First, options were considered a "safe-harbor" from the government's just-introduced $1 million cap on deductible compensation. Second, since options were not recorded as an expense on accounting statements, they were treated as "free" or cheap to grant (when, in fact, they are especially expensive ways to convey compensation). Third, government policies and stock-exchange listing rules encouraged firms to grant options to all employees, which in turn increased executive grants. Ultimately, too many options were granted to too many people. The explosion in option grants continued

unabated until the burst of the Internet bubble in 2000, followed by a series of accounting scandals that re-focused attention on the accounting treatment of options. Eventually, FASB mandated expensing, and companies moved away from options towards restricted stock, which largely stopped the escalation in CEO pay. But, the "option episode" permanently shifted pay levels for USA executives, which in turn has had global repercussions.

The stock-option experience in Europe has followed different paths than in the USA. We showed how the explosion in option grants in the UK in the 1980s can be traced to government policy to encourage employee stock ownership, while the UK's retreat from options in the 1990s can be traced to government reaction over perceived pay excesses at recently privatized utilities. Option plans became legal in France in 1970, but the first plans was not introduced until 1984 when the government ruled that options would be taxed as capital gains rather than ordinary income. In 1995, the government changed its mind and began taxing options as ordinary income rather than capital gains. Proposals to restore the favourable treatment of options in France were derailed in late 1999 following a scandal involving option-based golden parachute payments. In Germany, option plans were not even legalized until 1996, and were still challenged in a series of high-profile lawsuits brought by a "gadfly" college professor. While the lawsuits were typically unsuccessful, many companies responded by adding performance hurdles that must be met before options were exercised; in 2003 the government made such hurdles mandatory. In Italy, a series of government actions designed to promoted the use of options increased their popularity beginning in 1998 and lasting through 2006, when a new series of government actions reduced their popularity. In 1999, the Spanish government increased taxes on stock options after it was revealed that the CEO of the recently privatized telephone company – and boyhood friend of the prime minister – was about to make a fortune exercising options.

In every country we surveyed, we found that ebbs and flows in option grants followed government intervention, usually reflecting tax policies. In many cases, the government interventions were reactions (some would say "knee jerk") to isolated events or situations. Since the triggering events vary across countries, the nature of the government intervention – and the subsequent use of stock options – has also varied. The "perfect storm" that triggered the option explosion in the USA has not been repeated anywhere in Europe, and therefore the use of options (and equity-based pay in general) continues to be much lower in Europe.

Although we do not find in general that USA vs. European pay practices are quickly converging (indeed, the USA Pay Premium grew in 2008 after declining for several years), we find that the "early adopters" of USA-style plans are the European firms competing for

American customers, capital, and employees. Indeed, several large European firms introduced or expanded their option plans after acquiring USA subsidiaries (such as Daimler-Benz's acquisition of Chrysler, or BP's acquisition of Amoco) with managerial workforces that demanded and commanded USA-style pay. European firms with USA-based institutional shareholders and those cross-listed on USA exchanges also offer more generous and more incentive-focused compensation plans.

A positive consequence of the USA option explosion is that the fortunes of USA CEOs have become tightly linked to the fortunes of USA shareholders. In addition to analyzing cross-continent differences in the level and composition of CEO pay, we contrasted incentives for USA and European executives. We compared the year-end value of CEO stock and option holdings in 2006 (pre-crash) and 2008 (post-crash) – measured in euros or as a ratio to cash compensation or firm value – and found dramatically higher stock holdings for the median USA CEO than for the median European CEO. Coupled with the relative paucity of equity-based compensation for European CEOs, we conclude that CEOs in Europe face few direct incentives tied to shareholder wealth.

In the absence of direct incentives through stock and option holdings, European CEOs might be rewarded (or penalized) for stock-price performances through their bonus plans. However, with the exception of Germany and the UK, we found no evidence that bonuses vary with the returns to shareholders. Indeed, we even found an insignificant link between bonuses and accounting performance in half of the European countries surveyed. Overall, there is no evidence that the interest of the typical European CEO is aligned with the interest of shareholders.

The "bright spot" for incentives for European CEOs occurs in an unlikely place: the banking sector. In our analysis of pay-performance elasticities for banks vs. non-banks we document a statistically strong relation between bonuses and shareholder returns for European banks, and an insignificant relation in non-banks (after excluding Germany and the UK).

Which brings us to the financial crisis and those banking bonuses, which allegedly created risk-taking incentives that created the financial meltdown. In our analysis of these bonuses, we note that the challenge historically has been providing incentives for risk-averse executives to take *enough* risk, not *too much* risk. We also note that there are exactly two ways that compensation policy can induce excessive risk taking: through asymmetric rewards and penalties for performance (i.e., providing a reward for success but no penalty for failure)

or through bad performance measures (e.g., paying mortgage brokers on the number of loans they write, as opposed to the number that might actually get paid back).

We find no evidence in bonus asymmetries for banking CEOs in Europe or the USA. We do find that the compensation structure for European banks relies less on salaries and more on bonuses than the structure for non-bankers. Moreover, we find the average and median bonus for European banking CEOs fell 70% and 100% between 2006 and 2008, compared to modest drops of 14% and 10% for non-banking CEOs. Indeed, we found that bonuses for European banking CEOs fell even more than bonuses in the USA banking sector from 2006 to 2008 (which in turn fell much more than in the USA non-banking sector). Finally, we find that banking CEOs in Europe hold much more stock and options than do European non-banking CEOs, and that the value of these holdings fell much more for banking CEOs than non-banking CEOs. These results – coupled with our result that bonuses in the banking sector are strongly related to shareholder returns – suggests that performance measurement issues are also not to blame for excessive risk taking by European banking CEOs.

5.2. Should Executive Pay be Regulated?

As documented in this study, the reality is that executive pay *is* already heavily regulated on both sides of the Atlantic. Throughout Europe and the USA, there are disclosure rules, tax policies, and accounting standards designed explicitly to address perceived abuses in executive compensation. There is also direct intervention, such as the prohibitions on option grants and incentive bonuses in bailed-out banks in the USA and France. Common to all existing and past attempts to regulate pay are important (and usually undesirable) unintended consequences. For example, the 1984 USA laws introduced to reduce golden parachute payments led to a proliferation of change-in-control arrangements, employment contracts, and tax gross-ups. Similarly, the 1993 deductibility cap on non-performance-related pay is generally credited with fueling the escalation in pay levels and option grants in the 1990s, and the enhanced disclosure of perquisites in the 1970s is generally credited with fueling an explosion in the breadth of benefits offered to USA executives.

The unintended consequences from regulation are not always negative. For example, reporting requirements in the 2002 USA Sarbanes-Oxley bill (in which executives receiving options had to report those options within 48 hours) are generally credited for stopping the unsavory practice of "option backdating," even though the authors of the bill had no idea the practice existed. As another example, the draconian regulations imposed on USA banks

accepting government bailouts had the positive effect of getting USA investors paid back much more-quickly than anyone expected, in order to escape the regulations. Even the 1993 deductibility cap – which backfired in its attempt to slow the growth in CEO pay – had the positive effect of greatly increasing the alignment between USA CEOs and their shareholders. But, these positive effects are accidents and cannot be relied upon. For example, while the 50% tax on banking bonuses in France and the UK may cause these firms to rely more on equity-based compensation rather than cash bonuses (which would be a positive outcome), the more plausible response will be an increase in base salaries (i.e., a negative outcome).

Thus, our strong recommendation is to resist calls for further government regulation, and indeed governments should re-examine the efficacy of policies already in place. Part of the problem is that regulation – even when well intended – inherently focuses on relatively narrow aspects of compensation allowing plenty of scope for costly circumvention. An apt European analogy is the Dutch boy using his fingers to plug holes in a dike, only to see new leaks emerge. The only certainty with pay regulation is that new leaks will emerge in unsuspected places, and that the consequences will be both unintended and costly.

A larger part of the problem is that the regulation is often mis-intended. The regulations are inherently political and driven by political agendas, and politicians seldom embrace "creating shareholder value" as their governing objective. While the pay controversies fueling calls for regulation have touched on legitimate issues concerning executive compensation, the most vocal critics of CEO pay (such as members of labor unions, disgruntled workers and politicians) have been uninvited guests to the table who have had no real stake in the companies being managed and no real interest in creating wealth for company shareholders. Indeed, a substantial force motivating such uninvited critics is one of the least attractive aspects of human beings: jealousy and envy. Although these aspects are never part of the explicit discussion and debate surrounding pay, they are important and impact how and why governments intervene into pay decisions.

Our concerns about regulation notwithstanding, we do support legislation for enhanced disclosure of individual compensation arrangements (including stock options), currently absent in Austria and Greece and only recently imposed in Spain and Portugal. Our support is admittedly self-interested (as consumers of these data), and we recognize that enhanced disclosure will lead to more (and not less) controversies over pay. Moreover, based on the experiences of Canada and other countries introducing disclosure requirements, we predict that enhanced disclosure will lead to both higher levels of pay and convergence towards

USA-style pay as the "highest common denominator" (where by "highest" we mean in terms of generosity not efficiency). However, while we would not advocate full convergence to the USA model (which has its own problems), we believe that movement "towards" the USA focus on pay for performance would be good for shareholders on both continents.

Our calls for less rather than more regulation is not meant to indicate support for the status quo, but rather the reality that increased intervention is much more likely to make things worse rather than better. We perceive major problems with European-style executive pay packages, and are especially concerned with the lack of alignment between CEO and shareholder interests. The solutions to these problems will best emanate from boards of directors and compensation committees, and not from the governments. Our recommendations for European firms include:

- Boards should increase the percentage of compensation paid in the form of restricted stock, performance shares, or stock options. To the extent the new elements are largely added on top of existing compensation plans (i.e., without reductions in base salaries or bonuses), they should come in the form of performance shares or performance-vesting options. Restricted shares are appropriate when the grants are accompanied by a reduction in base salaries.

- Boards should encourage executives to exchange part of their base salaries for restricted shares, offered at a reasonable discount.

- If stock options are granted, the exercise date should be specified in advance and not left to the discretion of the executive.

- Boards should enforce stock ownership guidelines or provide incentives for executives to hold equity well past the time when restricted shares vest or options become exerciseable.

- To the extent feasible, bonus formulas should provide for symmetric rewards and penalties. Symmetric rewards can be facilitated by reducing base salaries while increasing target bonuses: bonus payouts "below target" even when positive constitute penalties for poor performance.

- Some portion of annual bonuses should always be deferred to allow for recovery of rewards if and when there is future revision of critical indicators on which the rewards were based or received. (While especially relevant for financial companies, this recommendation can be applied to all companies.)

- Similarly, some portion of annual bonuses should be paid in shares that are subject to forfeiture if and when there is future revision of critical indicators on which the rewards were based or received.

- Even if not mandated by the government, Boards should make disclosures of individual compensation packages (including details on grants and holdings under equity-based plans) as recommended by the European Commission.

Given the recent financial meltdown and controversies involving the "bank bonus sector," the banking sector warrants special consideration:

- Our recommendations for boards to impose symmetric rewards and penalties (including the imposition of "negative bonuses" through deferred payments, bonus banks, and bonus payments in the form of stock) is especially critical in banking, since the scope of manipulating short-run vs. long-run performance metrics is arguably higher in this sector.

- Similarly, our recommendations for boards to introduce and enforce "clawback" arrangements allowing for recovery of ill-gotten rewards is also especially important for this sector.

However, we believe that calls for especially stringent reforms or punitive taxes on banking bonuses are misguided and ultimately counter-productive:

- While we conclude that it is "especially important" for banks to have bonuses that are more "symmetric," deferred, performance-contingent, and paid in restricted shares as well as cash – coupled with smaller base salaries (as a percentage of total pay) and higher bonus opportunities – we also find that banking CEO pay in both the USA and Europe are already are better-aligned with our recommendations compared to CEOs in other sectors.

- While it is a fact that pay in the banking sector over the past two decades has increased relative to pay in other sectors, we also recognize that there is no direct empirical evidence (and not for a lack of trying) that this either the level or structure of pay in banking was an important factor leading to the financial crisis.

- Moreover, while there are arguments (albeit little evidence) that the level of CEO pay reflects CEO influence over their own pay levels, compensation levels and structures for banking employees well below the top executive levels are clearly set in a competitive market, reflecting the highly specialized skills in understanding and trading in increasingly complex derivative instruments. Overall, regulating compensation in

financial services will ultimately be driven by political concerns and will cripple one of the world's most important, and historically most productive, industries.

References

Aboody, David, Mary E. Barth, and Ron Kasznik, 2004, Firms' Voluntary Recognition of Stock-Based Compensation Expense, *Journal of Accounting Research* 42, 123-150.

Abowd, John and Michael Bognanno, 1995, International Differences in Executive and Managerial Compensation, in R. Freeman, and L. Katz, eds.: *Differences and Changes in Wage Structures* (The University of Chicago Press).

Abowd, John M., and David S. Kaplan, 1999, Executive Compensation: Six Questions That Need Answering, *Journal of Economic Perspectives* 13, 145-168.

Agrawal, A, and G Mandelker, 1987, Managerial Incentives and Corporate Investment and Financing Decisions, *Journal of Finance* 42, 823-837.

Annan, Grace, 2009, "EU Finance Ministers Back Curbing of Bank Bonuses," *IHS Global Insight Daily Analysis* (September 4).

Anthony, Charles, 1980, "Changes to encourage share-holding," *Guardian* (May 17).

Association of British Insurers, 1994, Long term remuneration for senior executives, (London).

Association of British Insurers, 1995, Share options and profit sharing incentive schemes, (London).

Baker, George P, and Brian Hall, 2004, CEO Incentives and Firm Size, *Journal of Labor Economics* 22, 767-798.

Barrie, Chris, Stephen Bates, and Roger Cowe, 1995, "Fury as National Grid chiefs use loophole to avoid tax on share option profits," *Guardian* (May 26).

Bebchuk, Lucian A, and Jesse M Fried, 2004a. *Pay without Performance: The Unfufilled Promise of Executive Compensation* (Harvard University Press, Cambridge, MA).

Bebchuk, Lucian A, and Jesse M Fried, 2004b, Stealth Compensation via Retirement Benefits, *Berkeley Business Law Journal* 1, 291-326.

Bebchuk, Lucian A, Yaniv Grinstein, and Urs Peyer, 2010, Lucky CEOs and Lucky Directors, *Journal of Finance* forthcoming.

Bebchuk, Lucian Arye, and Jesse M. Fried, 2003, Executive Compensation as an Agency Problem, *Journal of Economic Perspectives* 17, 71+.

Bebchuk, Lucian Arye, Jesse M. Fried, and David I. Walker, 2002, Managerial Power and Rent Extraction in the Design of Executive Compensation, *University of Chicago Law Review* 69, 751-846.

Bechmann, Ken L., and Johannes Raaballe, 2009, Bad Corporate Governance and Powerful CEOs in Banks: Poor Performance, Excessive Risk-taking, and a Misuse of Incentive-based Compensation, (Copenhagen Business School and University of Aarhus).

Beltratti, Andrea, and Rene´ M. Stulz, 2009, Why Did Some Banks Perform Better During the Credit Crisis? A Cross-Country Study of the Impact of Governance and Regulation, (Bocconi University and the Ohio State University).

"Bentsen Opposes FASB On Reporting Stock Options," 1993, *Wall Street Journal* (April 7).

Berle, Adolf A., and Gardiner C. Means, 1932. *The Modern Corporation and Private Property* (Macmillan Publishing Co., New York).

Berton, Lee, 1992, "Business chiefs try to derail proposal on stock options," *Wall Street Journal* (February 5).

Berton, Lee, 1994, "Accounting Rule-Making Board's Proposal Draws Fire," *Wall Street Journal* (January 5).

Bettner, Jill, 1981, "Incentive Stock Options Get Mixed Reviews, Despite the Tax Break They Offer Executives," *Wall Street Journal* (August 24).

Black, Fischer, and Myron S. Scholes, 1973, The Pricing of Options and Corporate Liabilities, *Journal of Political Economy* 81, 637-654.

Boyd, John H., Ravi Jagannathan, and Sungkyu Kwak, 2009, What Caused the Current Financial Mess and What Can We Do About It?, *Journal of Investment Management* 7, 1-17.

Braithwaite, Tom, Krishna Guha, and Greg Farrell, 2009, "Fed rejects global formula for bonuses," *Financial Times* (October 22).

Bray, Chad, 2009, "Crisis on Wall Street: Merrill Gave $1 Million Each to 700 Of Its Staff," *Wall Street Journal* (February 12).

Brunello, Giorgio, Clara Graziano, and Bruno Parigi, 2001, Executive compensation and firm performance in Italy, *International Journal of Industrial Organization* 19, 133-161.

Brunnermeier, Markus K., 2009, Deciphering the Liquidity and Credit Crunch 2007–2008, *Journal of Economic Perspectives* 23, 77-100.

Bryan, Stephen, Robert Nash, and Ajay Patel, 2006, The Structure of Executive Compensation: International Evidence from 1996-2004, (Wake Forest University).

"C-bank calls upon Italian banks to stick to managers' pay rules," 2009, (October 29).

"Call for Dresdner execs to return bonuses get mixed response," 2009, *Banking Newslink* (March 31).

Calvert, Jonathan, and Dean Nelson, 1995, "Exposed: the utility chief millionaires," *Observer* (May 14).

Carreyrou, John, 2002, "A French CEO's Taste For America Is Hard To Swallow Back Home --- Move to New York Was Faux Pas For Vivendi's Mr. Messier; A Rocker's Hail to the Chief," *Wall Street Journal*

Carreyrou, John, 2003a, SEC Decision Could Imperil Messier's Push For Severance, *Wall Street Journal*.

Carreyrou, John, 2003b, "Vivendi, Messier to Pay $51 Million to Settle Charges," *Wall Street Journal* (December 24).

Carter, Mary Ellen, and Luann J. Lynch, 2003, The Consequences of the FASB's 1998 Proposal on Accounting for Stock Option Repricing, *Journal of Accounting & Economics* 35, 51-72.

Castle, Stephen, Katrin Bennhold, and Steven Erlanger, 2009, "France joins U.K. to curb big bonuses by the banks; Combined assault aimed at pressuring others to limit financial institutions," *International Herald Tribune* (December 11).

Castle, Stephen, Katrin Bennhold, and Louise Story, 2009, "France joins Britain in a levy on bonuses; United call for bank tax is meant to raise pressure on U.S. and other nations," *International Herald Tribune* (December 12).

Cheng, Ing-Haw, Harrison Hong, and Jose Scheinkman, 2009, Yesterday's Heroes: Compensation and Creative Risk-Taking, (Princeton University).

Chronicle Staff and Wire Reports, 1992, "Big Earners cashing in now: fearful of Clinton's tax plans, they rush to exercise their options," *San Francisco Chronicle* (December 29).

"Chrysler Chairman Defends Option Plan, Offers to Discuss It With Federal Officials," 1963, *Wall Street Journal* (December 23).

"Chrysler Officers Got Profit of $4.2 Million On Option Stock in '63," 1964, *Wall Street Journal* (January 15).

"Chrysler Officers' Sale of Option Stock Could Stir Tax Bill Debate," 1963, *Wall Street Journal* (December 18).

"Clinton Enters Debate Over How Companies Reckon Stock Options," 1993, *Wall Street Journal* (December 23).

Cohen, Lauren, Andrea Frazzini, and Christopher Malloy, 2008, The Small World of Investing: Board Connections and Mutual Fund Returns, *Journal of Political Economy* 116, 951-979.

"Congress and Taxes: Specialists Mull Ways to Close "Loopholes" in Present Tax Laws," 1959, *Wall Street Journal* (January 7).

Conyon, Martin J., John E. Core, and Wayne R. Guay, 2009, Are US CEOs Paid More Than UK CEOs? Inferences From Risk-Adjusted Pay, (Wharton).

Conyon, Martin J., and Kevin J. Murphy, 2000, The Prince and the Pauper? CEO Pay in the United States and United Kingdom, *Economic Journal* 110, F640-F671.

Conyon, Martin J., and Kevin J. Murphy, 2002, Stock-Based Executive Compensation, in J. McCahery, P. Moerland, T. Raaijmakers, and L. Renneboog, eds.: *Corporate Governance Regimes: Convergence and Diversity* (Oxford University Press).

Conyon, Martin J., and Joachim Schwalbach, 2000, Executive Compensation: Evidence from the UK and Germany, *Long Range Planning* 33, 504-526.

Coughlan, Anne T., and Ronald M. Schmidt, 1985, Executive Compensation, Management Turnover and Firm Performance: An Empirical Investigation, *Journal of Accounting & Economics* 7, 43-66.

Crystal, Graef, 1991. *In Search of Excess: The Overcompensation of American Executives* (W.W. Norton & Company, New York).

Cummins, Chip, 2004, "Shell's Outside Auditors Got Warning on Reserves in 2002," *Wall Street Journal* (July 15).

Cuomo, Andrew M., 2009, No Rhyme or Reason: The 'Heads I Win, Tails You Lose' Bank Bonus Culture, (State of New York).

"Cut High Salaries or Get No Loans, is RFC Warning," 1933, *New York Times* (May 29).

Dahiya, Sandeep, and David Yermack, 2008, You Can't Take It With You: Sunset Provisions for Equity Compensation When Managers Retire, Resign, or Die, *Journal of Corporate Finance* 14, 499-511.

Davies, Lizzy, 2009, "France announces bank bonus crackdown and urges G20 nations to follow suit," *The Guardian* (August 26).

Davis, John, 1982, "Cheap Shares," *Observer* (October 24).

DeFusco, R, R. Johnson, and T. Zorn, 1990, The Effect of Executive Stock Option Plans on Stockholders and Bondholders, *Journal of Finance* 45, 617-627.

Delaney, Kevin J., and David Wessel, 1999a, "Lumpy Gravy: Suppose Stock Options Involved More Pain Than Financial Gain --- That's the Case in Europe, Which Helps to Explain High-Tech Lag There --- `A Bit Perverted' in France," *Wall Street Journal* (December 21).

Delaney, Kevin J., and David Wessel, 1999b, "Lumpy Gravy: Suppose Stock Options Involved More Pain Than Financial Gain – That's the Case in Europe, Which Helps to Explain High-Tech Lag There – `A Bit Perverted' in France," *Wall Street Journal* (December 21).

Dibben, Margaret, 1983, "Opening up the options," *Guardian* (November 19).

Eckhouse, John, 1987, "Tech Firms' Study: Accounting Rule Attacked," *San Francisco Chronicle* (April 10).

Edmans, Alex, and Xavier Gabaix, 2009, Is CEO Pay Really Inefficient? A Survey of New Optimal Contracting Theories, *European Financial Management* 15.

Elia, Charles J, 1967, "Opting for Options: Stock Plans Continue in Widespread Favor Despite Tax Changes," *Wall Street Journal* (July 15).

Erkens, David, Mingyi Hung, and Pedro Matos, 2010, Corporate Governance in the 2007-2008 Financial Crisis: Evidence from Financial Institutions Worldwide, (University of Southern California).

Esmerk, 2009, "Finland: Banking and insurance sector bonuses to be restricted," *Esmerk Finnish News* (December 11).

EU Commission, 2007, Report on the application by Member States of the EU of the Commission Recommendation on directors' remuneration.

Fahlenbrach, Ru¨diger, and Rene´ M. Stulz, 2010, Bank CEO Incentives and the Credit Crisis, *Journal of Financial Economics* forthcoming.

Farrell, Gregg, and Francesco Guerra, 2008, "Top Executives at Morgan Stanley and Merrill forgo their bonuses," *Financial Times* (December 9).

Fernandes, Nuno, Miguel A. Ferreira, Pedro Matos, and Kevin J. Murphy, 2009, The Pay Divide: (Why) Are U.S. Top Executives Paid More?, ECGI Finance Working Paper No. 255/2009.

Ferreira, Miguel, and Pedro Matos, 2008, The Colors of Investors' Money: The Role of Institutional Investors Around the World, *Journal of Financial Economics* 88, 499-533.

Ferri, Fabrizio, and Tatiana Sandino, 2009, The Impact of Shareholder Activism on Financial Reporting and Compensation: The Case of Employee Stock Options Expensing, *The Accounting Review* 84, 433-466.

"Fighting Commodities Speculation Priority,Not Bank Pay: Italy PM," 2009, *Dow Jones International News* (September 8).

Fisher, Lawrence M., 1986, "Option Proposal Criticized," *New York Times* (December 27).

Fitzpatrick, Dan, and Kara Scannell, 2009, "BofA Hit by Fine Over Merrill --- Bank Pays SEC $33 Million in Bonus Dispute; Sallie Krawcheck Hired in Shake-Up," *Wall Street Journal* (August 4).

Flanigan, James, 1996, "It's Time for All Employees to Get Stock Options," *Los Angeles Times* (April 21).

Ford, Richard, 1992, "Water chiefs' £20m shares windfall angers Labour," *Times* (June 1).

"France, Germany want bonus curbs," 2009, *The Times* (September 1).

Freudenheim, Milt, 1993, "Experts see tax curbs on executives' pay as more political than fiscal," *New York Times* (February 12).

Fried, Jesse M, 2008a, Hands-Off Options, *Vanderbilt Law Review* 61.

Fried, Jesse M, 2008b, Option Backdating and its Implications, *Washington & Lee Law Review* 65.

Fried, Jesse M., 1998, Reducing the Profitability of Corporate Insider Trading Through Pretrading Disclosure, *Southern California Law Review* 71, 303-392.

Frydman, Carola, 2010, Rising Through the Ranks: The Evolution of the Market for Corporate Executives, 1936-2003, (MIT Working Paper).

Frydman, Carola, and Dirk Jenter, 2010, CEO Compensation, (MIT Working Paper).

Frydman, Carola, and Raven Saks, 2005, Historical Trends in Executive Compensation, 1936-2003, Harvard University Working Paper.

Frydman, Carola, and Raven E. Saks, 2008, Executive Compensation: A New View from a Long-Term Perspective, 1936-2005, FEDS Working Paper No. 2007-35.

"G20 : Buzek Backs Calls to Limit Bankers' Pay," 2009, *Europolitics* (September 10).

"G20 punts on bank bonuses," 2009, *UPI Energy Resources* (September 5).

"G-20 Leaders Near Bank-Pay Limits Amid Protests," 2009, *Associated Press* (September 24).

Gabaix, Xavier, and Augustin Landier, 2008, Why has CEO Pay Increased So Much?, *Quarterly Journal of Ecoonomics* 123, 49-100.

Gauthier-Villars, David, 2009, "Leading the News: Sarkozy, banks set new limits on bonuses --- Pay czar to monitor best-paid traders at France's banks," *Wall Street Journal Europe* (August 26).

"Germany backs calls to limit banker bonuses," 2009, *Agence France Presse* (August 28).

"Germany: Keeping stumm over executive pay," 2004, *Economist Intelligence Unit* (August 19).

"Germany's pay law: Disclosure is right - but anti-business rhetoric is futile," 2005, *Financial Times* (May 20).

Goodman, Peter S., and Gretchen Morgenson, 2008, "By Saying Yes, WaMu Built Empire on Shaky Loans," *New York Times* (December 27).

Graham, Robert, 2000a, "Fabius sets date for stock option plan," *Financial Times* (April 26).

Graham, Robert, 2000b, "The soft option - The compromise reached over the taxing of executive share," *Financial Times* (April 28).

Greenbury, Richard, 1995. *Directors' Remuneration: Report of a Study Group Chaired by Sir Richard Greenbury* (Gee Publishing, London).

Greenhouse, Steven, 1993, "Deduction proposal is softened," *New York Times* (April 9).

Gupta, Udayan, and Lee Berton, 1986, "Start-up Firms Fear Change in Accounting," *Wall Street Journal* (June 23).

Hall, Ben, 2009, "French government backs bonus windfall tax," (December 16).

Hall, Brian J., and Jeffrey B. Liebman, 1998, Are CEOs Really Paid Like Bureaucrats?, *Quarterly Journal of Economics* 113, 653-691.

Hall, Brian J., and Kevin J. Murphy, 2002, Stock Options for Undiversified Executives, *Journal of Accounting & Economics* 33, 3-42.

Hall, Brian J., and Kevin J. Murphy, 2003, The Trouble with Stock Options, *Journal of Economic Perspectives* 17, 49+.

Hampel, R., 1998. *Committee on Corporate Governance: Final Report* (Gee Publishing, London).

Harding, James, and Jo Johnson, 2002, "Messier can expect a rough ride over golden parachute exit package," *Financial Times* (July 4).

Harlan, Christi, 1994, "High Anxiety: Accounting Proposal Stirs Unusual Uproar In Executive Suites," *Wall Street Journal* (March 7).

Harlan, Christi, and Lee Berton, 1992, "Accounting Firms, Investors Criticize Proposal on Executives' Stock Options," " *Wall Street Journal* (February 19).

Harrington, Ben, 2009, "Credit Suisse to loan cash bonuses," *Sunday Telegraph* (January 18).

Harrison, Rebecca, 2003, "Ex-Alstom chief waived severance pay for "honour"," *Reuters News* (October 22).

Hartzell, Jay, Eli Ofek, and David Yermack, 2004, What's In It For Me? CEOs Whose Firms Are Acquired, *Review of Financial Studies* 17, 37-61.

Heron, Randall A., and Erik Lie, 2006a, Does Backdating Explain the Stock Price Pattern Around Executive Stock Option Grants?, *Journal of Financial Economics*.

Heron, Randall A., and Erik Lie, 2006b, What Fraction of Stock Option Grants To Top Executives Have Been Backdated or Manipulated, Unpublished Working Paper.

Hirshleifer, David, and R Suh, 1992, Risk, Managerial Effort, and Project Choice, *Journal of Financial Intermediation*, 308-345.

"House Group Hears Conflicting Views on Stock Option Taxes," 1959, *Wall Street Journal* (December 8).

"House Unit Seen Favoring Curbs on Stock Options," 1963, *Wall Street Journal* (February 25).

Hudson, Richard L., 1983, "SEC Rules Allow Concerns to Curb Pay Disclosure: Companies Likely to Divulge Less on Executive Fees, Incentives, and Stock Options," *Wall Street Journal* (September 23).

Hyatt, James C, 1975, "No Strings: Firms Lure Executives By Promising Bonuses Not Linked To Profits," *Wall Street Journal* (December 24).

Inman, Phillip, 2009, "Finance ministers disagree on bonuses," *Australian Financial Review* (September 3).

"Italy's Compart To Offer Execs Stock Options; Joins Trend," 1998, *Dow Jones International News* (March 16).

Jack, Andrew, 1994, "France to Reform Stock Options," *Financial Times* (December 22).

Jack, Andrew, 1995, "Paris Urges Share Option Reform," *Financial Times* (May 17).

Jagger, Suzy, and Alexandra Frean, 2009, "Sarkozy back-pedals over his demands for worldwide cap on banking bonuses," *The Times* (September 25).

Jensen, Michael C., and William H. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure, *Journal of Financial Economics* 3, 305-360.

Jensen, Michael C., and Kevin J. Murphy, 1990a, CEO Incentives: It's Not How Much You Pay, But How, *Harvard Business Review* 68, 138-153.

Jensen, Michael C., and Kevin J. Murphy, 1990b, Performance Pay and Top Management Incentives, *Journal of Political Economy* 98, 225-265.

Jensen, Michael C., Kevin J. Murphy, and Eric Wruck, 2011. *CEO Pay and What To Do About It: Restoring Integrity to Both Executive Compensation and Capital-Market Relations* (Harvard Business School Press, Cambridge, MA).

Johnson, Jo, 2001, "Gucci chiefs may net $390m," *Financial Times* (November 2001).

Johnson, Jo, 2002, "Messier under pressure from board to resign," *Financial Times* (July 1).

Kashyap, Anil, Raghuram Rajan, and Jeremy Stein, 2008, Rethinking Capital Regulation, (University of Chicago).

Kling, Arnold, 2009, Not What They Had in Mind: A History of Policies that Producted the Financial Crisis of 2008, (George Mason University).

Lambert, Richard A., David F. Larcker, and Robert E. Verrecchia, 1991, Portfolio Considerations in Valuing Executive Compensation, *Journal of Accounting Research* 29, 129-149.

Larsen, Peter Thal, 2009, "Rules unlikely to end bonus furore," *Financial Times* (April 2).

Lekakis, George, 2009, "Bank executives face $50m loss under bonus bans," *The Advertiser* (September 7).

Lie, Erik, 2005, On the Timing of CEO Stock Options Awards, *Management Science* 51, 802-812.

Liebowitz, Stan J., 2009, Anatomy of a Train Wreck: Causes of the Mortgage Meltdown, in Benjamin Powell, and Randall Holcomb, eds.: *Housing America: Building Out of a Crisis*.

Lublin, Joann S, and Mike Esterl, 2008, "Executive Pay Curbs Go Global," *Wall Street Journal* (October 21).

Main, B. G., 1999, The Rise and Fall of Executive Share Options in Britain, in J. Carpenter, and D. Yermack, eds.: *Executive Compensation and Shareholder Value: Theory and Evidence* (Kluwer Academic Press, Dordrecht, Netherlands).

Marchettini, Piero, 2001, Share options in Italy: Recent executive compensation trends, *Benefits & Compensation International* 30, 26-33.

Maremont, Mark, 2005, "Authorities probe improper backdating of options: Practice allows executives to bolster their stock gains; a highly beneficial pattern," *Wall Street Journal* (Nov. 11).

Marshall, Robert, 2008, "Loss Of Tax Exemption For Italian Stock Options Has A Silver Lining," *Mondaq Business Briefing* (September 19).

McCarroll, Thomas, 1992, "The Shareholders Strike Back: Executive Pay," *Time* (May 5).

Merton, R.C., 1973, The Theory of Rational Option Pricing, *Bell Journal of Economics and Management Science* 4, 141-183.

Meulbroek, Lisa K., 2001, The Efficiency of Equity-Linked Compensation: Understanding the Full Cost of Awarding Executive Stock Options, *Financial Management*, 5-30.

Moffett, Sebastian, 2009, "France Faces Pressure Over Bonuses As Natixis Sets $94.6 Million Payout," *The Wall Street Journal* (March 28).

Monaghan, Angela, 2009a, "Brown sets out plan for bonus clampdown," *Daily Telegraph* (September 4).

Monaghan, Angela, 2009b, "Brown sets out plan for bonus clampdown," *The Daily Telegraph* (September 4).

Moullin, Mavis, 1980, "Better schemes now for profit-sharing," *Guardian* (August 16).

Mullaney, Thomas E, 1951, "Parley Here Indicates the Continued Spread in Industry of Stock Purchase Option Plans," *New York Times* (August 12).

Murphy, Kevin J., 1985, Corporate Performance and Managerial Remuneration: An Empirical Analysis, *Journal of Accounting & Economics* 7, 11-42.

Murphy, Kevin J., 1999, Executive Compensation, in Orley Ashenfelter, and David Card, eds.: *Handbook of Labor Economics* (North Holland).

Murphy, Kevin J., 2002, Explaining Executive Compensation: Managerial Power vs. the Perceived Cost of Stock Options, *University of Chicago Law Review* 69, 847-869.

Murphy, Kevin J., 2003, Stock-Based Pay in New Economy Firms, *Journal of Accounting & Economics* 34, 129-147.

Murphy, Kevin J., 2011a, Executive Compensation: Pay, Performance, and Politics, in George Constantinides, Milton Harris, and René Stulz, eds.: *Handbook of the Economics of Finance*.

Murphy, Kevin J., 2011b, The Politics of Pay, in Jennifer Hill, and Randall S. Thomas, eds.: *The Research Handbook on Executive Pay* (Edgar Elgar).

Murphy, Kevin J., and Jan Zábojník, 2007, Managerial Capital and the Market for CEOs, USC Working paper.

Muslu, Volkan, 2008, Inside Board Membership, Pay Disclosures and Incentive Compensation in Europe, (University of Texas at Dallas).

O'Brian, Heather, 1998, "Italian Companies Begin to Provide Stock Options, Details of Financial Data," *Wall Street Journal* (May 29).

"Options on the Wane: Fewer Firms Plan Sale of Stock to Executives at Fixed Exercise Prices," 1960, *Wall Street Journal* (December 6).

Piskorski, Tomasz, Amit Seru, and Vikrant Vig, 2010, Securitization and Distressed Loan Renegotiation: Evidence from the Subprime Mortgage Crisis, (Columbia Unversity).

"Politics and Policy—Campaign '92: From Quayle to Clinton, Politicians are Pouncing on the Hot Issue of Top Executive's Hefty Salaries," 1992, *Wall Street Journal* (January 15).

"President Studies High Salary Curb: Tax Power is Urged as Means of Controlling Stipends in Big Industries," 1933, *New York Times* (October 23).

"Railroad Salary Report: I.C.C. Asks Class 1 Roads About Jobs Paying More Than $10,000 a Year," 1932, *Wall Street Journal* (April 28).

"RFC Fixed Pay Limits: Cuts Required to Obtain Loans," 1933, *Los Angeles Times* (May 29).

Ricklefs, Roger, 1975, "Sweetening the Pot: Stock Options Allure Fades, So Firms Seek Different Incentives," *Wall Street Journal* (May 27).

Ricklefs, Roger, 1977, "Firms Offer Packages of Long-Term Incentives as Stock Options Go Sour for Some Executives," *Wall Street Journal* (May 9).

Ricklefs, Roger, 1984, "Changing Course: French Voters Prod Socialist Leadership To Veer Right Sharply --- Government Reduces Taxes, Advocates Stock Options; Impetus: Unemployment --- Virtues of Private Enterprise," *Wall Street Journal* (September 26).

RiskMetrics, 2009. *Study On Monitoring And Enforcement Practices In Corporate Governance In The Member States*.

Robbins, L. H., 1933, "Inquiry into High Salaries Pressed by the Government," *New York Times* (October 29).

Rosen, Sherwin, 1981, The Economics of Superstars, *American Economic Review* 71, 845-858.

Rosen, Sherwin, 1982, Authority, Control, and the Distribution of Earnings, *Bell Journal of Economics* 13, 311-323.

Rosen, Sherwin, 1992, Contracts and the market for executives, in L. Werin, and H. Wijkander, eds.: *Contract Economics* (Oxford University Press).

Rudnitsky, Howard, and Richard Green, 1985, "Options Are Free, Aren't They?," *Forbes* (August 26).

Salvatore, Salvatore di, 2000, "Taxation Of Stock Options - A Summary Of Latest Developments - Graham & James," *Mondaq Business Briefing* (March 1).

Scannell, Kara, Liz Rappaport, and Jess Bravin, 2009, "Judge Tosses Out Bonus Deal --- SEC Pact With BofA Over Merrill Is Slammed; New York Weighs Charges Against Lewis," *Wall Street Journal* (September 15).

"SEC to Push for Data on Pay of Executives," 1992, *Wall Street Journal* (January 21).

"Senate Unit Votes to Tighten Rules on Stock Options," 1964, (January 15).

"Share Options: Employees shares fillip," 1984, *Guardian* (March 14).

"Shareholder Groups Cheer SEC's Moves on Disclosure of Executive Compensation," 1992, *Wall Street Journal* (February 14).

Siconolfi, Michael, 1992, "Wall Street is upset by Clinton's support on ending tax break for 'excessive' pay," *Wall Street Journal* (October 21).

Simensen, Ivar, 2006, "Debate Over Remuneration Has Led To Changes In German Corporate Governance," *Financial Times* (October 23).

Smith, Geoffrey T., 2009, "Germany's BaFin Clamps Down On Bank Risk Mgmt, Bonuses," *Dow Jones International News* (August 14).

Stanton, Ted, 1964, "Cash Comeback: Stock Options Begin to Lose Favor in Wake of Tax Law Revision," *Wall Street Journal* (August 10).

Stewart, G. Bennett, 1990, Remaking the Corporation from Within, *Harvard Business Review* 68, 126-137.

Stewart, G. Bennett, 1991. *The Quest for Value: A Guide for Senior Managers* (Harper Business, New York).

Story, Louise, 2008, "Chief Struggles to Revive Merrill Lynch," *New York Times* (July 18).

"Sweden central bank chief: banking bonuses need to change," *Reuters News* (September 3).

Taylor, John B., 2009, The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong, Rock Center Working Paper No. 30 (Stanford University).

Thomas, Randall S., 2008, International Executive Pay: Current Practices and Future Trends, (Vanderbilt University Law School).

Turner, Adair, 2010, After the Crises: Assessing the Costs and Benefits of Financial Liberalisation, 14th Chintaman Deshmukh Memorial Lecture, Reserve Bank of India, Mumbai.

"UBS to change to the way it pays senior managers," 2008, *Associated Press Newswires* (November 17).

"UK joins issue with France on bonus issue," 2009, *Global Banking News* (August 26).

"Unicredit: New Salary Regulations Already Implemented," 2009, *ANSA - English Corporate News Service*

Werdel, Alyce, and Valerie Diamond, 2002, "Navigating stock options in Europe," *Workspan* (August 1).

White, Michael, and Mark Milner, 1995, "Anger over utility chiefs' £40m share bonanza," *Guardian* (May 15).

Wilson, Harry, 2009a, "Financial News: Unicredit pulls bonuses at its investment bank," *Wall Street Journal Europe* (March 9).

Wilson, James, 2009b, "German banks set to speed up pay reform," *Financial Times* (December 10).

Woodruff, David, 2000, "A Vanishing European Taboo: Disclosing Executives Pay --- Goal of Single Market, Pressure Abroad Help; Response Is Unexcited," *Wall Street Journal* (September 11).

Yermack, David, 1995, Do Corporations Award CEO Stock Options Effectively>, *Journal of Financial Economics* 39, 237-269.

Yermack, David, 1997, Good timing: CEO stock option awards and company news announcements, *Journal of Finance* 52, 449-476.

Yermack, David, 2006a, Flights of Fancy: Corporate Jets, CEO Perquisites, and Inferior Shareholder Returns, *Journal of Financial Economics* 80.

Yermack, David, 2006b, Golden Handshakes: Separation Pay for Retired and Dismissed CEOs, *Journal of Accounting and Economics* 41, 237-256.

Yermack, David, 2009, Deductio Ad Absurdum: CEOs Donating Their Own Stock to Their Own Family Foundations, *Journal of Financial Economics* 94.

Zuckerman, Gregory, Jenny Strasburg, and Mike Esterl, 2008, "VW's 348% Two-Day Gain Is Pain For Hedge Funds," *Wall Street Journal* (October 29).